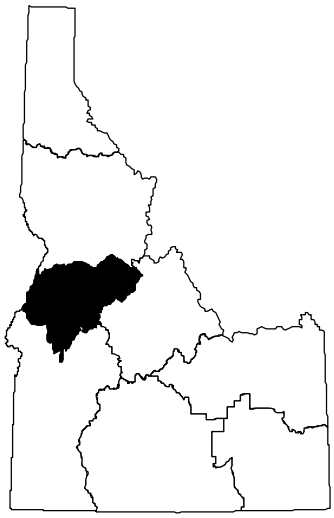
FISHERY MANAGEMENT INVESTIGATIONS

IDAHO DEPARTMENT OF FISH AND GAME

FISHERY MANAGEMENT ANNUAL REPORT

Steven M. Huffaker, Director



SOUTHWEST REGION – McCALL

2003

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2003 ANNUAL PERFORMANCE REPORT

State of: Idaho | Program: Fisheries Management F-71-R-28

Project I: Surveys and Inventories | Subproject I-C: Southwest Region (McCall)

Job: a | Title: Mountain Lakes Investigation

Contract Period: January 1, 2003 to December 31, 2003

ABSTRACT

We completed Idaho Department of Fish and Game standard mountain lake surveys on eight lakes in 2003 to assess physical habitat parameters and stocking strategies. We collected only westslope cutthroat trout *Oncorhynchus clarkii lewisi* from Morgan Lake (07-155), Coffee Cup Lake (07-157), and Heart Lake (09-378), and only brook trout *Salvelinus fontinalis* from Disappointment Lake (07-158) and North Sister Lake (Sisters #1) (09-371). The remaining lakes sampled contained a mix of salmonid species.

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OBJECTIVES

1. Evaluate fisheries management strategies in alpine lakes.

2. Identify problems and/or opportunities in lakes that currently are not being directly managed.

INTRODUCTION

The Idaho Department of Fish and Game conducts standard mountain lake surveys each year to evaluate and adjust the mountain lakes fish-stocking program and to document fish species presence in lakes that are not stocked. We completed surveys on eight lakes in 2003.

METHODS

We examined fish populations and habitat in eight lakes using the Department's standard mountain lake survey methods. We set one gill net (125-ft sinking) in each lake late in the afternoon and pulled it the next morning. All fish collected were weighed to the nearest gr and total length was measured to the nearest mm. Presence/absence surveys for amphibians were performed at each of the eight lakes and one pond using the Photographic Identification Cards for Idaho Amphibians prepared by Charles R. Peterson and Henry J. Fabian.

RESULTS

Department personnel collected fish population and habitat data from Morgan Lake (07-155), Coffee Cup Lake (07-157), Disappointment Lake (07-158), Serene Lake (07-159), North Sister Lake (Sisters #1) (09-371), South Sister Lake (Sisters #2) (09-372), Heart Lake (09-378), and Brush Lake (09-387) in 2003.

Heart Lake is a small and shallow lake (maximum depth of 4.4 meters) in which we collected only one fish, a westslope cutthroat trout *Oncorhynchus clarki lewisi*. We also found only westslope cutthroat trout in Morgan Lake and Coffee Cup Lake. Morgan Lake probably gets the most traffic and use compared to the other seven lakes due to its accessibility to All Terrain Vehicles. Only four fish were collected there, but all were at least 375 mm (14.8 inches) and two out of those four fish exceeded 508 mm (20 inches). Although Morgan Lake may not have as many fish as other lakes, the size of the fish are exceptional.

We collected only brook trout *Salvelinus fontinalis* in Disappointment Lake and North Sister Lake (Sisters #1). The forty-one brook trout collected in North Sister Lake ranged from 111 to 217 mm in length, indicating a stunted population. We collected rainbow trout *Oncorhynchus mykiss* and cutthroat trout from Brush Lake, but found none of the golden trout *Oncorhynchus aguabonita* or artic grayling *Thymallus arcticus* stocked in Brush Lake in 2002. Our samples from Serene Lake and South Sister Lake consisted of both brook trout and cutthroat trout. We also found rainbow trout/cutthroat trout hybrids in South Sister Lake.

The Length frequencies and average condition factors of fish collected from each lake are listed in Table 1. Completed survey forms are presented in Appendices A through H.

Presence/absence surveys for amphibians were done at each of the eight lakes and one pond. A large number of Western toads *Bufo boreas* was observed at North Sister Lake. Western toads were also observed at Brush Lake, as were Columbia spotted frogs *Rana luteiventris*. Columbia spotted frogs were also present at Heart Lake. We observed Columbia spotted frogs, tadpoles and a salamander which we were unable to identify at the pond between Heart Lake and Brush Lake (UTM coordinates: 579,185.99M E, 4,988,771.17M N, Z11). The salamander, which was dead when we found it, was taken as a sample and sent to Dr. Charles R. Peterson, Idaho State University, and we are awaiting identification. Amphibians were more readily observed during brief breaks in the cold temperatures during the two weeks that we surveyed. Several night temperatures were below freezing and snow was not uncommon during the day. Overall, amphibian and insect data are lacking due to the cold weather. More species would probably have been observed during warmer weather. Likewise, angler data is lacking for some lakes due to inclement weather.

Table 1. Total number and average condition factors (Ktl) or relative weights (Wr) by length group of each species of fish sampled in mountain lakes in 2003.

Lake	Cat. No.	Species Ktl/ Wr	Total length (inches)													
			≤ 4	5	6	7	8	9	10	11	12	13	14	15	16	17+
Morgan	07-155	CUT											1			3
		Ktl											NA			1.39
Coffee Cup	07-157	CUT	2							1	3	2				
		Ktl	NA							0.98	0.97	0.89				
Disappointment	07-158	BRK					1		1		1	1		1		
		Wr					86.3		89.4		70.1	88.5		60.4		
Serene	07-159	BRK									3	2				
		Wr									86.0	82.0				
		CUT	1					1			1	9	2	1		
		Ktl	0.10					1.00			1.07	1.04	NA	NA		
North Sister (#1)	09-371	BRK	13	6	4	15	3									
		Wr	NA	NA	69.7	66.8	60.5									
South Sister (#2)	09-372	BRK			1	1	3	1		1				1		
		Wr			NA	98.5	112.8	113.0		78.0				97.7		
		CUT									5	4				
		Ktl									1.00	0.98				
		RXC									1	2				
		Ktl									1.07	0.99				
Heart	09-378	CUT												1		
		Ktl												0.86		
Brush	09-387	RBT	1		2	5		4	2	3		1		1		
		Ktl	NA		1.02	1.19		1.14	1.08	1.11		0.98		1.16		
		CUT						1		3						
		Ktl						1.05		NA						

RECOMMENDATIONS

1. Continue to monitor fish populations in high mountain lakes in the region and make appropriate management changes.
2. Continue working with the Payette National Forest personnel collecting baseline fisheries and habitat data in high mountain lakes.

LITERATURE CITED

Janssen, P.J., K. Apperson and D.R. Anderson. 2000. Regional fishery management investigations. Federal aid in fish restoration. 1995 Job performance report, Project F-71-R-20. Idaho Department of Fish and Game.

APPENDICES

Appendix A. Morgan Lake Survey Form.

Lake Name: Morgan Date: 9/18/03
IDFG Catalog #: 07 - 0155 EPA #:
Major Drainage: Salmon River Minor Drainage:
County: Idaho Region: 3
USFS Ranger District: McCall Wilderness Area:
Section: 8 Township: 21N Range: 2E Elevation: 6379 Ft.

Physical:
Lake Type: 2 1. Cirque 2. Moraine 3. Slump 4. Caldera 5. Beaver
Total Surface Area: 1.7 ha
Depth Profile: 2
1. deep (75% of lake >6m deep)
2. moderate (50% of lake >6m deep)
3. shallow (25% of lake >6m deep)
Maximum Depth: 14.33m
Average Depth: 7.53m

Aspect: NW - 1&4
1. Lake has north facing exposure
2. Lake has south facing exposure
3. Lake has east facing exposure
4. Lake has west facing exposure
5. Lake is exposed on all directions

Chemical:
Alkalinity: 0 mg/l
Conductivity: 10omhos/cm^2
Secchi depth: 4.74 m

pH: 7.2
Temp (surface): 13.5 F
Temp (bottom): 11.0 F

Spawning Potential:
Inlet(s): 0(number)
Length accessible for spawning:
0 m
Inlet spawning suitability: ---

Outlet(s): 1(dry)(number)
Length a accessible for spawning:
0 m
Outlet spawning suitability: 4

1. excellent (abundant)
2. adequate (enough to maintain suitable spawning populations)
3. fair (not enough to maintain population)
4. poor (not suitable for successful spawning)

Use:
Campsites: 2 (number) Fire Pits: 2 (number) Litter: L☒ M☐H☐
Trail around lake: ☒ complete ☐ partial ☐ none trampled: ☒Y☐N
Access: ☒ good trail ☐ poor trail ☐ cross country
Access directions:

Biological:
Zooplankton Composition and Density
Genera Identified % of sample Size Density(g/l)
No observation.

Appendix A. Continued.

Insect Composition and Abundance:

Aquatic Genera	Relative Abundance	Terrestrial Genera	Relative Abundance
	L☐M☐H☐	Blue damsel	L☐M☒H☐
	L☐M☐H☐		L☐M☐H☐
	L☐M☐H☐		L☐M☐H☐

Fish Survey:

Fisherman: 3 (numbers) Hours Fished: 3
Fish Caught: 1 Fish/hour: 0.3 Abundance: L☒M☐H☐

Length Frequency:

	Total Length (mm)								
Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	400+
CUT								1	3
Total								1	3

Fish Condition:

	Total Length (mm)		Weight (g)		Condition (k or Wr)	
Species	Mean	Range	Mean	Range	Mean	Range
CUT	471	375-545	967*	820-1080*	1.39*	0.80-1.74*
		*No	weight	measure-	ments on	one fish.

Stocking History:

Year	Species	Number	Comments
1992	CUT	1000	
1995	CUT	1000	
1998	CUT	1000	
2001	CUT	1000	

Comments:
Hardness: 25 ppm.
USFS habitat survey information gathered. Hard copy in file.

Appendix B. Coffee Cup Lake Survey Form.

Lake Name: Coffee Cup Date: 9/17/03
IDFG Catalog #: 07 - 0157 EPA #:
Major Drainage: Salmon River Minor Drainage:
County: Idaho Region: 3
USFS Ranger District: McCall Wilderness Area:
Section: 9 Township: 21N Range: 2E Elevation: 7305 Ft.

Physical:
Lake Type: 1 1. Cirque 2. Moraine 3. Slump 4. Caldera 5. Beaver
Total Surface Area: 2.2 ha
Depth Profile: 3
1. deep (75% of lake >6m deep)
2. moderate (50% of lake >6m deep)
3. shallow (25% of lake >6m deep)
Maximum Depth: 7.62m
Average Depth: 4.97m

Aspect: 1
1. Lake has north facing exposure
2. Lake has south facing exposure
3. Lake has east facing exposure
4. Lake has west facing exposure
5. Lake is exposed on all directions

Chemical:
Alkalinity: 0 mg/l
Conductivity: 20omhos/cm^2
Secchi depth: 2.9 m

pH: 7.7
Temp (surface): 10.9 F
Temp (bottom): 10.0 F

Spawning Potential:
Inlet(s): 1 + 4 springs (number)
Length accessible for spawning:
~3 m
Inlet spawning suitability: 3

Outlet(s): 2(number)
Length a accessible for spawning:
-- m
Outlet spawning suitability: 4

1. excellent (abundant)
2. adequate (enough to maintain suitable spawning populations)
3. fair (not enough to maintain population)
4. poor (not suitable for successful spawning)

Use:
Campsites: 5 (number) Fire Pits: (number) Litter: L☒ M☐H☐
Trail around lake: ☒ complete ☐ partial ☐ none trampled: ☒Y☐N
Access: ☒ good trail ☐ poor trail ☐ cross country
Access directions:

Biological:
Zooplankton Composition and Density
Genera Identified % of sample Size Density(g/l)
No observation.

Appendix B. Continued.

Insect Composition and Abundance:

Aquatic Genera	Relative Abundance	Terrestrial Genera	Relative Abundance
Hemiptera (waterbugs)	L☐M☐H☐	Very cold.	L☐M☐H☐
White/blue tiny flies	L☐M☐H☐	Not much	L☐M☐H☐
when sun came out.	L☐M☒H☐	activity.	L☐M☐H☐

Fish Survey:

Fisherman: 3 (numbers) Hours Fished: 1.5
Fish Caught: 0 Fish/hour: 0 Abundance: L☒M☐H☐

Length Frequency:

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	400+
CUT			2			1	5		
Total			2			1	5		

Fish Condition:

	Total Length (mm)		Weight (g)		Condition (k or Wr)	
Species	Mean	Range	Mean	Range	Mean	Range
CUT	269	108-337	358*	<50-440	0.94*	0.86-1.07*
* 2 smaller	fish	excluded	due to	unknown	weights.	

Stocking History:

Year	Species	Number	Comments
1993	CUT	500	1992 - 1000 Cutthroat stocked
1995	CUT	500	
1997	CUT	500	
1999	CUT	500	
2001	CUT	500	

Comments:
Hardness: 25 ppm.
Very cold. Not much activity.
USFS habitat survey information gathered. Hard copy in file.

Appendix C. Disappointment Lake Survey Form.

Lake Name: Disappointment Date: 9/17/03
IDFG Catalog #: 07 - 0158 EPA #:
Major Drainage: Salmon River Minor Drainage:
County: Idaho Region: 3
USFS Ranger District: McCall Wilderness Area:
Section: 3 Township: 21N Range: 2E Elevation: 6865 Ft.

Physical:
Lake Type: 1 1. Cirque 2. Moraine 3. Slump 4. Caldera 5. Beaver
Total Surface Area: 6.2 ha
Depth Profile: 1
1. deep (75% of lake >6m deep)
2. moderate (50% of lake >6m deep)
3. shallow (25% of lake >6m deep)
Maximum Depth: 20.73m
Average Depth: 13.03m

Aspect: 1
1. Lake has north facing exposure
2. Lake has south facing exposure
3. Lake has east facing exposure
4. Lake has west facing exposure
5. Lake is exposed on all directions

Chemical:
Alkalinity: 0 mg/l
Conductivity: 20omhos/cm^2
Secchi depth: 6.93 m

pH: 9.3
Temp (surface): 11.5 F
Temp (bottom): 11.0 F

Spawning Potential:
Inlet(s): 5 + 3 springs (number)
Length accessible for spawning:
>24.384 m
Inlet spawning suitability: 2

Outlet(s): 1(number)
Length a accessible for spawning:
>12.192 m
Outlet spawning suitability: 1

1. excellent (abundant)
2. adequate (enough to maintain suitable spawning populations)
3. fair (not enough to maintain population)
4. poor (not suitable for successful spawning)

Use:
Campsites: 1 (number) Fire Pits: 1 (number) Litter: L☐ M☐H☐
Trail around lake: ☐ complete ☒ partial ☐ none trampled: ☒Y☐N
Access: ☒ good trail ☐ poor trail ☐ cross country
Access directions:Good trail to the ridgetop. Walking down to the lake by the creek you pick up an unmaintained trail about a quarter mile of the way down.

Biological:
Zooplankton Composition and Density
Genera Identified % of sample Size Density(g/l)
No observation.

Appendix C. continued.

Insect Composition and Abundance:

Aquatic Genera	Relative Abundance	Terrestrial Genera	Relative Abundance
Very cold.	L☐M☐H☐		L☐M☐H☐
No activity!	L☐M☐H☐		L☐M☐H☐
	L☐M☐H☐		L☐M☐H☐

Fish Survey:

Fisherman: 0 (numbers) Hours Fished: 0
Fish Caught: --- Fish/hour: --- Abundance: L☐M☐H☐

Length Frequency:

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	400+
BRK					1	1	2	1	
Total					1	1	2	1	

Fish Condition:

	Total Length (mm)		Weight (g)		Condition (k or Wr)	
Species	Mean	Range	Mean	Range	Mean	Range
BRK	309	224-387	316	120-470	79	60.37-89.40

Stocking History:

Year	Species	Number	Comments
1992	BLT	200	14.0/lb. brook trout rotenoned in 1991.
2001	CUT	500	Not present in sample. Mgr added 2001.
2002	GLN	500	GLN=Golden trout. Not present in sample.

Comments:
Hardness: 25 ppm.
Very cold. No activity.
USFS habitat survey information gathered. Hard copy in file.

Appendix D. Serene Lake Survey Form.

Lake Name: Serene Date: 9/15/03
IDFG Catalog #: 07 - 0159 EPA #:
Major Drainage: Salmon River Minor Drainage:
County: Idaho Region: 3
USFS Ranger District: McCall Wilderness Area:
Section: 3 Township: 21N Range: 2E Elevation: 7109 Ft.

Physical:
Lake Type: 1 1. Cirque 2. Moraine 3. Slump 4. Caldera 5. Beaver
Total Surface Area: 3.8 ha
Depth Profile: 2
1. deep (75% of lake >6m deep)
2. moderate (50% of lake >6m deep)
3. shallow (25% of lake >6m deep)
Maximum Depth: 13.41m
Average Depth: 7.15m

Aspect: 1
1. Lake has north facing exposure
2. Lake has south facing exposure
3. Lake has east facing exposure
4. Lake has west facing exposure
5. Lake is exposed on all directions

Chemical:
Alkalinity: 0 mg/l
Conductivity: 10omhos/cm^2
Secchi depth: 3.1 m

pH: 9.2
Temp (surface): 14.5 F
Temp (bottom): 13.5 F

Spawning Potential:
Inlet(s): 6 springs(number)
Length accessible for spawning:
0 m
Inlet spawning suitability: 4

Outlet(s): 1(number)
Length a accessible for spawning:
0 m
Outlet spawning suitability: 4

1. excellent (abundant)
2. adequate (enough to maintain suitable spawning populations)
3. fair (not enough to maintain population)
4. poor (not suitable for successful spawning)

Use:
Campsites: 2 (number) Fire Pits: 2 (number) Litter: L☒ M☐H☐
Trail around lake: ☐ complete ☒ partial ☐ none trampled: ☒Y☐N
Access: ☒ good trail ☐ poor trail ☐ cross country
Access directions:

Biological:
Zooplankton Composition and Density
Genera Identified % of sample Size Density(g/l)
No observation.

Appendix D. Continued.

Insect Composition and Abundance:

Aquatic Genera	Relative Abundance	Terrestrial Genera	Relative Abundance
	L☐M☐H☐	Blue Damsel	L☐M☒H☐
	L☐M☐H☐	Grasshoppers	L☒M☐H☐
	L☐M☐H☐		L☐M☐H☐

Fish Survey:

Fisherman: 3 (numbers) Hours Fished: 8
Fish Caught: 6 Fish/hour: 0.75 Abundance: L☐M☒H☐

Length Frequency:

	Total Length (mm)								
Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	400+
CUT	1				1		11	1	1
BRK							5		
Total	1				1		16	1	1

Fish Condition:

	Total Length (mm)		Weight (g)		Condition (k or Wr)	
Species	Mean	Range	Mean	Range	Mean	Range
BRK	326	306-348	382	280-445	84.43	74.59-107.66
CUT	318	73-400	297*	40-380*	0.93*	0.10-1.11*
		*No	weight	measure-	ments on	six fish.

Stocking History:

Year	Species	Number	Comments
1994	CUT	400	500 cutthroat stocked in 1991.
1996	CUT	500	
1998	CUT	500	
2000	CUT	500	
2002	CUT	500	

Comments:
Hardness: 25 ppm.
Only cutthroat caught, but seemed to have more spots than usual.
USFS habitat survey information gathered. Hard copy in file.

Appendix E. North Sister (#1) Lake Survey Form.

Lake Name: North Sister (#1) Date: 9/9/03
IDFG Catalog #: 09-0371 EPA #:
Major Drainage: Payette River Minor Drainage: Box Creek
County: Valley Region: 3
USFS Ranger District: McCall Wilderness Area:
Section: 32 Township: 20N Range: 4E Elevation: 6960 Ft.

Physical:
Lake Type: 1 1. Cirque 2. Moraine 3. Slump 4. Caldera 5. Beaver
Total Surface Area: 1.7 ha
Depth Profile: 3
1. deep (75% of lake >6m deep)
2. moderate (50% of lake >6m deep)
3. shallow (25% of lake >6m deep)

Maximum Depth: 5.1m
Average Depth: 3.5m

Aspect: 1,4
1. Lake has north facing exposure
2. Lake has south facing exposure
3. Lake has east facing exposure
4. Lake has west facing exposure
5. Lake is exposed on all directions

Chemical:
Alkalinity: 0 mg/l pH: 8.5
Conductivity: 10omhos/cm^2 Temp (surface): 15.6 F
Secchi depth: . m Temp (bottom): 12.0 F

Spawning Potential:
Inlet(s): 6(number) Outlet(s): 1(number)
Length accessible for spawning: --- m
Length a accessible for spawning: --- m
Inlet spawning suitability: 4 Outlet spawning suitability: 1
1. excellent (abundant)
2. adequate (enough to maintain suitable spawning populations)
3. fair (not enough to maintain population)
4. poor (not suitable for successful spawning)

Use:
Campsites: 2 (number) Fire Pits: 2 (number) Litter: L☒ M☐H☐
Trail around lake: ☐ complete ☒ partial ☐ none trampled: ☐Y☐N
Access: ☐ good trail ☐ poor trail ☒ cross country
Access directions: Crestline trail.

Biological:
Zooplankton Composition and Density
Genera Identified % of sample Size Density(g/l)
No observation.

Appendix E. Continued.

Insect Composition and Abundance:

Aquatic Genera	Relative Abundance	Terrestrial Genera	Relative Abundance
None present.	L☐M☐H☐		L☐M☐H☐
Cold weather.	L☐M☐H☐		L☐M☐H☐
	L☐M☐H☐		L☐M☐H☐

Fish Survey:

Fisherman: 0 (numbers) Hours Fished: 0
Fish Caught: --- Fish/hour: --- Abundance: L☐M☐H☐

Length Frequency:

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	400+
BRK			19	19	3				
Total			19	19	3				

Fish Condition:

	Total Length (mm)		Weight (g)		Condition (k or Wr)	
Species	Mean	Range	Mean	Range	Mean	Range
BRK	157	111-217	52	< or = 30-80	66	51.65-81.38

Stocking History:

Year	Species	Number	Comments
			Unable to find a documented history.

Comments:
Hardness: 25 ppm.
Amphibians: Plethora of small (~2cm long) Western toads (Bufo boreas).
All small brook trout, possibly a stunted population?
USFS habitat survey information gathered. Hard copy in file.

Appendix F. South Sister Lake (#2) Survey Form.

Lake Name: South Sister (#2) Date: 9/10/03
IDFG Catalog #: 09-0372 EPA #:
Major Drainage: Payette River Minor Drainage: Box Creek
County: Valley Region: 3
USFS Ranger District: McCall Wilderness Area:
Section: 32 Township: 20N Range: 4E Elevation: 7080 Ft.

Physical:
Lake Type: 1 1. Cirque 2. Moraine 3. Slump 4. Caldera 5. Beaver
Total Surface Area: 0.6 ha
Depth Profile: 3
1. deep (75% of lake >6m deep)
2. moderate (50% of lake >6m deep)
3. shallow (25% of lake >6m deep)

Maximum Depth: 2.9m
Average Depth: 2.1m

Aspect: 1
1. Lake has north facing exposure
2. Lake has south facing exposure
3. Lake has east facing exposure
4. Lake has west facing exposure
5. Lake is exposed on all directions

Chemical:
Alkalinity: 0 mg/l
Conductivity: 10omhos/cm^2
Secchi depth: 1.4 m

pH: 8
Temp (surface): 12.0 F
Temp (bottom): 11.0 F

Spawning Potential:
Inlet(s): 5(number)
Length accessible for spawning:
--- m
Inlet spawning suitability: 4

Outlet(s): 1(number)
Length a accessible for spawning:
--- m
Outlet spawning suitability: 2

1. excellent (abundant)
2. adequate (enough to maintain suitable spawning populations)
3. fair (not enough to maintain population)
4. poor (not suitable for successful spawning)

Use:
Campsites: 1 (number) Fire Pits: 1 (number) Litter: L☒ M☐H☐
Trail around lake: ☐ complete ☒ partial ☐ none trampled: ☐Y☐N
Access: ☐ good trail ☐ poor trail ☒ cross country
Access directions: Crestline trail.

Biological:
Zooplankton Composition and Density
Genera Identified % of sample Size Density(g/l)
No observation.

Appendix F. Continued.

Insect Composition and Abundance:

Aquatic Genera	Relative Abundance	Terrestrial Genera	Relative Abundance
Cold weather limited	L☐M☐H☐		L☐M☐H☐
observation.	L☐M☐H☐		L☐M☐H☐
	L☐M☐H☐		L☐M☐H☐

Fish Survey:

Fisherman: 0 (numbers) Hours Fished: 0
Fish Caught: --- Fish/hour: --- Abundance: L☐M☐H☐

Length Frequency:

	Total Length (mm)								
Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	400+
BRK				2	3	2		1	
CUT							9		
RBT/CUT							3		
Total				2	3	2	12	1	

Fish Condition:

	Total Length (mm)		Weight (g)		Condition (k or Wr)	
Species	Mean	Range	Mean	Range	Mean	Range
BRK	241	176-292	179*	75-300*	103.65*	77.98-117.48*
CUT	326	308-349	353	270-450	0.99	0.92-1.09
RBT/CUT	328	318-336	350	300-400	1.02	0.95-1.07

* The weight of one fish is excluded due to a recording error in the field.

Stocking History:

Year	Species	Number	Comments
2000	CUT	200	

Comments:
Hardness: 25 ppm.
Snowing!!!
USFS habitat survey information gathered. Hard copy in file.

Appendix G. Heart Lake Survey Form.

Lake Name: Heart Date: 9/9/03
IDFG Catalog #: 09-0378 EPA #:
Major Drainage: Payette River Minor Drainage: Box Creek
County: Valley Region: 3
USFS Ranger District: McCall Wilderness Area:
Section: 29 Township: 20N Range: 4E Elevation: 7040 Ft.

Physical:
Lake Type: 2 1. Cirque 2. Moraine 3. Slump 4. Caldera 5. Beaver
Total Surface Area: 0.5 ha
Depth Profile: 3
1. deep (75% of lake >6m deep)
2. moderate (50% of lake >6m deep)
3. shallow (25% of lake >6m deep)

Maximum Depth: 4.4m
Average Depth: 2.8m

Aspect: 4
1. Lake has north facing exposure
2. Lake has south facing exposure
3. Lake has east facing exposure
4. Lake has west facing exposure
5. Lake is exposed on all directions

Chemical:
Alkalinity: 0 mg/l
Conductivity: 10omhos/cm^2
Secchi depth: 1.3 m

pH: 9
Temp (surface): 17.0 F
Temp (bottom): 13.0 F

Spawning Potential:
Inlet(s): 3 + 1 spring(number)
Length accessible for spawning:
--- m
Inlet spawning suitability: 4

Outlet(s): 1(number)
Length a accessible for spawning:
--- m
Outlet spawning suitability: 4

1. excellent (abundant)
2. adequate (enough to maintain suitable spawning populations)
3. fair (not enough to maintain population)
4. poor (not suitable for successful spawning)

Use:
Campsites: 2 (number) Fire Pits: 1 (number) Litter: L☐ M☒H☐
Trail around lake: ☐ complete ☒ partial ☐ none trampled: ☒Y☐N
Access: ☒ good trail ☐ poor trail ☐ cross country
Access directions: Crestline trail.

Biological:
Zooplankton Composition and Density
Genera Identified % of sample Size Density(g/l)
No observation.

Appendix G. Continued.

Insect Composition and Abundance:

Aquatic Genera	Relative Abundance	Terrestrial Genera	Relative Abundance
Trichoptera	L☒M☐H☐	1st freeze of	L☐M☐H☐
Coleoptera	L☒M☐H☐	year, insect	L☐M☐H☐
	L☐M☐H☐	abundance low	L☐M☐H☐

Fish Survey:

Fisherman: 2 (numbers) Hours Fished: 0.5
Fish Caught: 0 Fish/hour: 0 Abundance: L☒M☐H☐

Length Frequency:

	Total Length (mm)								
Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	400+
CUT								1	
Total								1	

Fish Condition:

	Total Length (mm)		Weight (g)		Condition (k or Wr)	
Species	Mean	Range	Mean	Range	Mean	Range
CUT	385	385	660	660	0.86	0.86

Stocking History:

Year	Species	Number	Comments
2000	CUT	500	
2001	CUT	500	

Comments:
Hardness: 42 ppm? (2.5grains per gallon).
Amphibians: Columbia spotted frogs (Rana luteiventris).
USFS habitat survey information gathered. Hard copy in file.

Appendix H. Brush Lake Survey form.

Lake Name: Brush Date: 9/11/03
IDFG Catalog #: 09 - 0387 EPA #:
Major Drainage: Payette River Minor Drainage:
County: Valley Region: 3
USFS Ranger District: McCall Wilderness Area:
Section: 20 Township: 20N Range: 4E Elevation: 7028 Ft.

Physical:
Lake Type: 1 1. Cirque 2. Moraine 3. Slump 4. Caldera 5. Beaver
Total Surface Area: 7.5 ha
Depth Profile: 2
1. deep (75% of lake >6m deep)
2. moderate (50% of lake >6m deep)
3. shallow (25% of lake >6m deep)

Maximum Depth: 8.8m
Average Depth: 3.9m

Aspect: 1,4
1. Lake has north facing exposure
2. Lake has south facing exposure
3. Lake has east facing exposure
4. Lake has west facing exposure
5. Lake is exposed on all directions

Chemical:
Alkalinity: 0 mg/l pH: 8.8
Conductivity: 20omhos/cm^2 Temp (surface): 13.0 F
Secchi depth: . m Temp (bottom): 13.0 F

Spawning Potential:
Inlet(s): 1 + 1 spring(number) Outlet(s): 1(number)
Length accessible for spawning: --- m
Length a accessible for spawning: --- m
Inlet spawning suitability: 4 Outlet spawning suitability: 1
1. excellent (abundant)
2. adequate (enough to maintain suitable spawning populations)
3. fair (not enough to maintain population)
4. poor (not suitable for successful spawning)

Use:
Campsites: 1 (number) Fire Pits: 5 (4 are old and unused) (number) Litter: L☒ M☐H☐
Trail around lake: ☐ complete ☒ partial ☐ none trampled: ☒Y☐N
Access: ☐ good trail ☒ poor trail ☒ cross country
Access directions: Mostly game trail off of Crestline trail.

Biological:
Zooplankton Composition and Density
Genera Identified % of sample Size Density(g/l)
No observation.

Appendix H. Continued.

Insect Composition and Abundance:

Aquatic Genera	Relative Abundance	Terrestrial Genera	Relative Abundance
Blue Damselfly	L☒M☐H☐		L☐M☐H☐
Mosquito	L☒M☐H☐		L☐M☐H☐
Coleoptera	L☐M☒H☐	<-- warming temps	L☐M☐H☐

Fish Survey:

Fisherman: 2 (numbers) Hours Fished: 1
Fish Caught: 4 Fish/hour: 4 Abundance: L☐M☒H☐

Length Frequency:

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	400+
RBT			1	7	3	6		2	
CUT						4			
Total			1	7	3	10		2	

Fish Condition:

	Total Length (mm)		Weight (g)		Condition (k or Wr)	
Species	Mean	Range	Mean	Range	Mean	Range
RBT	237	114-387	157	48-500	1.13	0.94-1.39
CUT	277	251-291	150*	150*	1.05*	1.05*
		*No	weight	measure-	ments on	three fish.

Stocking History:

Year	Species	Number	Comments
1995	RBT/CUT	1525	
1998	RBT/CUT	1000	
2001	RBT	600	
2001	CUT	500	
2002	GLN/AGR	500/215	GLN=Golden trout, AGR=Artic grayling. Not present in sample.

Comments:

Hardness: 25 ppm.
Amphibians: Western toads (Bufo boreas) and Columbia spotted frogs (Rana luteiventris), pictures available.
USFS habitat survey information gathered. Hard copy in file.

2003 ANNUAL PERFORMANCE REPORT

State of: Idaho | Program: Fisheries Management F-71-R-28

Project I: Surveys and Inventories | Subproject I-C: Southwest Region (McCall)

Job: b | Title: Lowland Lakes Investigations

Contract Period: January 1, 2003 to December 31, 2003

ABSTRACT

We conducted aerial counts of shore and boat anglers on July 4th holiday and Labor Day on Lake Cascade. Average number of fishing boats and shore anglers per count in 2003 was 17 and 6. These were the lowest counts ever recorded for these flights.

Hydroacoustic surveys were conducted on Payette Lake on June 22 and August 25, 2003.

Oxbow and Hells Canyon Reservoirs were sampled with standard lowland lakes surveys in July, 2003. Boat electrofishing and gill nets were employed.

We gillnetted Lost Valley Reservoir and captured hatchery rainbow trout *Oncorhynchus mykiss*, brook trout *Salvelinus fontinalis* and yellow perch *Perca flavescens.*

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LAKE CASCADE ANGLER COUNTS

INTRODUCTION

Annual angler counts have been made since 1996 on Memorial Day, July 4th and Labor Day to monitor angling pressure trends (Janssen et al. *In review*). These counts were made again in 2003.

Methods

We completed angler counts on Fourth of July and Labor Day on Lake Cascade. We conducted counts using a fixed wing airplane at 1000, 1400 and 1800 hrs on each day. All shore anglers and fishing boats were counted.

Results

The angler pressure trend on Lake Cascade continues to remain low. Average number of fishing boats and shore anglers per count in 2003 was 17 and 6 (Table 1). We made counts on only two holidays this year, missing Memorial Day due to poor weather. Yellow perch *Perca flavescens* fishing on the Lake continued to be virtually non-existent as the yellow perch population remained at historically low levels.

Table 1. Average boat and shore angler counts on Lake Cascade on three major holidays: Memorial Day, July 4th and Labor day, in 1982, 1991, 1992 and 1996 through 2003 with corresponding intensive creel survey angler hour estimates for 1982, 1991 and 1992.

Year	Holiday Counts		Estimated Angler Hours (hours * 1000)		
	Ave. # Boats	Ave. # Shore Anglers	Boat Anglers	Shore Anglers	Total Pressure[1]
1982	154	85	255.6	129.8	385.4
1991	41.5	32	135.2	102	237.2
1992	52.5	116	144.2	177.3	321.5
1996	35	27	--	--	--
1997	36.5	19	--	--	--
1998	58	39.5	--	--	--
1999	27	31	--	--	--
2000	15	12	--	--	--
2001	11	12	--	--	--
2002	16.5	12	--	--	--
2003	17	6	--	--	--

[1] Does not include ice fishing hours.

PAYETTE LAKE

INTRODUCTION

Kokanee *Oncorhynchus nerka kennerlyi* are the primary forage for lake trout *Salvelinus namaycush* in Payette Lake and kokanee eggs are usually in high demand by Department hatcheries for statewide stocking requests. Therefore, kokanee population estimates have been made on Payette Lake since 1990 to monitor this important lake trout forage and to predict kokanee surpluses in the lake for egg taking opportunities for state hatchery needs. To continue this monitoring a population estimate was made again in 2003. We completed two hydroacoustic surveys in 2003 to help more accurately estimate adult spawner kokanee numbers.

Methods

We utilized the IDFG hydroacoustics fish survey crew to estimate kokanee numbers in the lake. Butts (2004) gives a description of the equipment and methodology used.

Results

The hydroacoustic surveys of Payette Lake were completed on June 22, and August 25, 2003. Butts (*In Review*) estimated there were 179,142 $\pm$ 58,600 age-0 kokanee, 57,452 $\pm$ 20,246 age-1 kokanee, and 39,165 $\pm$ 20,312 age-2 and older kokanee in the June survey and 341,841 $\pm$ 131,005 age-0 kokanee, 142,319 $\pm$ 51,745 age-1 kokanee and 90,344 +/- 31,989 age-2 and greater kokanee in the August survey. Butts (In review) presents a more detailed report of the results.

OXBOW AND HELLS CANYON RESERVOIRS

INTRODUCTION

We completed an Idaho Department of Fish and Game (IDFG) standard lowland lake survey on Hells Canyon and Oxbow Reservoirs to examine fishery changes since the last surveys were completed in 1998.

Methods

Hells Canyon and Oxbow Reservoirs were electrofished and gillnetted to complete the lowland lakes standard surveys. Trap nets were not used at either reservoir due to their inefficiencies in these two waters. See intradepartmental memo: Lowland Lakes Standard Surveys, April 8, 1992 for description and methodology.

We set two floating and two sinking standard lowland lake survey gill nets in both Hells Canyon and Oxbow Reservoirs. We electrofished six randomly chosen shoreline transects in each reservoir. We sampled approximately ten minutes at each transect. We collected length data from all fish and weights and scale samples from up to five fish from each one-centimeter length group for all game fish species collected. Non game fish were counted and mass weighed. Collected scales were later aged and measured for length back-calculations.

Results

We electrofished a total of 1.0 and 1.3 hours in Oxbow and Hells Canyon Reservoirs respectively. We found smallmouth bass *Micropterus dolomieu* and channel catfish *Ictalurus punctatus* to be the most abundant fish in both Oxbow and Hells Canyon Reservoir's (Tables 2 and 3). Total biomass of fish collected was dominated by smallmouth bass and channel catfish in Oxbow Reservoir, and by smallmouth bass and carp *Cyprinus carpio* in Hell's Canyon Reservoir. We collected a total of 14 species of fish from both Oxbow Reservoir and Hells Canyon Reservoirs. Total number, average weights, and relative weights by one cm length increments for each game fish species are presented in Tables 4 and 5 for Oxbow Reservoir and in Tables 7 and 8 for Hells Canyon Reservoir. Average back-calculated lengths for each age class of each game species collected from Oxbow and Hells Canyon Reservoirs are presented in Tables 6 and 9 respectively.

Table 2. Percent frequency and relative biomass of all species of fish collected July 10, 2003 in Oxbow Reservoir (all gear types combined[1]).

Species	# caught	% of catch	Total biomass	% of total weight
Smallmouth bass	373	62.0	69.085	32.7
Channel catfish	67	11.1	47.312	22.4
Bluegill *(Lepomis macrochirus)*	40	6.6	5.855	2.8
Chiselmouth *(Acrocheilus alutaceus)*	17	2.8	6.671	3.2
Northern pikeminnow *(Ptychocheilus*	55	9.1	26.185	12.4
Black crappie *(Pomoxis nigromaculatus)*	4	0.7	645	0.3
Rainbow trout *(Oncorhynchus mykiss)*	1	0.2	250	0.1
Largescale sucker *(Catostomus*	25	4.2	35.822	16.9
Yellow perch	2	0.3	185	0.1
White crappie *(Pomoxis annularis)*	8	1.3	1.862	0.9
Carp *(Cyprinus carpio)*	3	0.5	11.140	5.3
Bridgelip sucker *Catostomus*	6	1.0	5.667	2.7
Peamouth *Mylocheilus caurinus*	1	0.2	120	0.1
Flathead catfish *Pylodictis olivaris*	0	0	0	0

[1]: Includes 1.3 hours of electrofishing!

Table 3. Percent frequency and relative biomass of all species of fish collected July 8, 2003 in Hells Canyon (all gear types combined).

Species	# caught	% of catch	Total biomass (g)	% of total weight
Smallmouth Bass	606	71	63,208	32.6
White Crappie	3	.35	480	.25
Bluegill	33	3.9	9,293	4.8
Carp	22	2.6	46,380	23.9
Bridgelip Sucker	7	.82	2,950	1.5
Channel Catfish	46	5.4	15,813	8.1
Largescale Sucker	30	3.5	31,200	16.1
Black Crappie	10	1.2	1,149	.6
Northern pikeminnow	39	4.6	10,860	5.6
Chiselmouth	45	5.3	11,570	6.0
Rainbow Trout	1	.1	140	.07
Yellow Perch	12	1.4	1,072	.5

NOTE: Sculpin *Cottus spp?*, and dace *Rhinichthys spp.* were also collected present.

Table 4. Number, length, average weights and relative weights of smallmouth bass, channel catfish, and bluegill collected July 10, 2003 from Oxbow Reservoir.

Total length	Smallmouth bass				Channel catfish				Bluegill			
	# coll.	% of total #	Avg. wt	Rel. wt	# coll.	% of total #	Avg. wt	Rel. wt	# coll.	% of total #	Avg. wt	Rel. wt
50	1	.3	2	--	0				0			
60	0				0				0			
70	1	.3	3	--	0				0			
80	2	.5	4	--	0				0			
90	0				0				0			
100	2	.5	10	--	0				0			
110	0				0				2	5.0	32.5	130.8
120	0				0				1	2.5	80	210.7
130	1	.3	40	122.1	0				4	10.0	68.75	149.8
140	1	.3	40	106.8	1	1.4	15	73.3	3	7.5	88.3	150.2
150	7	1.9	52	105.7	1	1.4	15	58.6	8	20	117.5	156.9
160	18	4.8	66	113.1	0				3	7.5	140	157.0
170	17	4.6	77.5	103.1	0				5	12.5	156	140.1
180	22	5.9	89	103.9	0				1	2.5	195	140
190	31	8.3	101	99.3	1	1.4	50	83.4	7	17.5	192	123.0
200	25	6.7	120	104.1	2	2.9	50	72.1	6	15.0	248	133.1
210	24	6.4	136	103.9	2	2.9	64.5	82.5	0			
220	26	7.0	151	96.9	1	1.4	80	90.3	0			
230	27	7.2	171	95.8	2	2.9	95	92.8	0			
240	43	11.5	191	96.5	0				0			
250	28	7.5	214	94.5	0				0			
260	26	7.0	245	93.4	0				0			
270	21	5.6	255	85.5	2	2.9	152	84.8	0			
280	10	2.7	278	86.2	0				0			
290	14	3.75	316	87.9	1	1.4	150	63.3	0			
300	7	1.9	368	92.1	2	2.9	220	88.5	0			
310	4	1.1	372.5	85.5	1	1.4	200	72.7	0			
320	1	.3	380	81.2	4	5.8	262	83.3	0			
330	0				2	2.9	315	91.8	0			
340	1	.3	415	70.5	5	7.2	406	86.2	0			
350	2	.5	467.5	76.0	3	4.3	355	56.8	0			
360	1	.3	530	77.7	3	4.3	381	55.9	0			
370	3	.8	663	88.7	2	2.9	500	99.2	0			
380	1	.3	560	70.2	3	4.3	432	79.8	0			
390	3	.8	587	65.8	1	1.4	425	74.9	0			
400	1	.3	810	84.9	0				0			
410	2	.5	845	82.2	1	1.4	575	80.3	0			
420	0				3	4.3	682	94.3	0			
430	0				2	2.9	658.5	84.6	0			
440	0				2	2.9	732.5	84.4	0			
450	0				2	2.9	770	84.2	0			
460	0				3	4.3	860	86.2	0			
470	0				2	2.9	871	81.0	0			

Table 4, Continued.

Total length	Smallmouth bass				Channel catfish				Bluegill			
	# coll.	% of total #	Avg. wt	Rel. wt	# coll.	% of total	Avg. wt	Rel. wt	# coll.	% of total #	Avg. wt	Rel. wt
480	0				0							
490	0				2	2.9	1262	104.4				
500	0				0							
510	0				2	2.9	1300	96.0				
520	0				3	4.3	1577	108.8				
540	0				1	1.4	2000	116.3				
560	0				1	1.4	2100	109.4				
570	0				1	1.4	2500	128.0				
580	0				3	4.3	1933	92.6				
600	0				2	2.9	2700	115.6				

Table 5. Number, total lengths, weights and relative weights of black crappie, yellow perch, and white crappie collected July 10, 2003 from Oxbow Reservoir.

Total length	Black crappie				Yellow perch				White crappie			
	# coll.	% of total #	Avg. wt	Rel. wt	# coll.	% of total #	Avg. wt	Rel. wt	# coll.	% of total #	Avg. wt	Rel. wt
40	0				0				0			
50	0				0				0			
60	0				0				0			
70	0				0				0			
80	0				0				0			
90	0				0				0			
100	0				0				0			
110	0				0				0			
120	0				0				0			
130	0				0				0			
140	0				0				0			
150	0				0				0			
160	0				0				0			
170	0				0				0			
180	0				0				0			
190	1	25	120	110.8	0				0			
200	1	25	120	98.4	0				1	12.5	135	124.1
210	1	25	170	120.4	0				0			
220	0				0				0			
230	1	25	235	122.8	0				1	12.5	200	106.7
240	0				0				1	12.5	222	115.2
250	0				0				3	37.5	252	116.0
260	0				0				1	12.5	250	94.6
270	0				0				1	12.5	280	98.3

Table 6. Average back-calculated lengths for each age class of each species collected July 10, 2003 from Oxbow Reservoir.

Year class	Age	N	Back-calculation age																				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Smallmouth bass																							
2002	1	2	71																				
2001	2	11	77	133																			
2000	3	32	78	135	184																		
1999	4	19	77	134	184	222																	
1998	5	26	84	144	193	230	261																
1997	6	13	85	165	222	266	293	319															
1996	7	4	89	150	210	270	308	340	387														
	8																						
	9																						
All classes			80	141	193	238	275	324	387														
N		107	107	105	94	62	43	17	4														
Channel catfish																							
2002	1	0																					
2001	2	0																					
2000	3	0																					
1999	4	6	80	145	223	282																	
1998	5	9	94	150	202	252	298																
1997	3	3	133	180	235	305	375	429															
1996	7	6	104	163	229	285	345	383	404														
1995	8	7	100	140	179	221	267	293	234	342													
1994	9	10	112	178	249	297	359	396	428	461	490												
1993	10	2	130	185	255	310	353	398	440	480	509	535											
1992	11	1	103	141	189	274	359	455	496	527	547	574	602										
1991	12	3	80	123	178	218	275	296	319	356	394	418	431	444									
1990	13	3	103	157	250	276	318	348	380	403	435	457	482	499	521								
1989	14	2	97	141	163	184	198	207	223	234	267	285	298	308	325	339							
1988	15	1	82	133	162	179	194	208	228	248	251	265	288	291	299	319	328						
1987	16	1	96	109	151	197	214	231	248	285	319	340	353	374	395	416	432	445					
1986	17	0																					
1985	18	1	68	92	120	156	175	199	208	226	242	257	266	275	303	330	336	345	352	364			
All Classes			100	154	213	262	310	346	367	387	429	407	403	399	401	349	366	395	352	364			
N		55	55	55	55	55	49	40	37	31	24	14	12	11	8	5	3	2	1	1			

Table 6. Continued.

Year class	*Age*	N	Back-calculation age																				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Bluegill																							
2002	1	0																					
2001	2	0																					
2000	3	1	49	122	143																		
1999	4	1	38	74	134	155																	
All classes			44	98	139	155																	
N		2	2	2	2	1																	
Black crappie																							
2002	1	0																					
2001	2	0																					
2000	3	0																					
1999	4	3	105	167	203	228																	
All classes			105	167	203	228																	
N			3	3	3	3																	
White crappie																							
2002	1	0	0																				
2001	2	1	114	185																			
2000	3	1	90	209	250																		
1999	4	5	81	141	197	239																	
All classes			87	157	206	239																	
N		7	7	7	6	5																	

Table 7. Number, total lengths, weights, and relative weights of smallmouth bass, white crappie, and bluegill collected July 8, 2003 from Hells Canyon Reservoir.

Total length	Smallmouth bass				White crappie				Bluegill			
	# coll.	% of total #	Avg. wt	Rel. wt	# coll.	% of total #	Avg. wt	Rel. wt	# coll.	% of total #	Avg. wt	Rel. wt
40	0				0				5	20		
50	0				0				5	20		
60	4	.7	--		0				3	9.1		
70	21	3.5	--		0				0			
80	18	3.0	--		0				1	3.0		
90	8	1.3	--		0				0			
100	0		--		0				1	3.0	19	53.4
110	8	1.3	--		0				1	3.0	--	
120	26	4.3	27	106.5	0				5	20	56.4	154.2
130	45	7.4	29.5	90.2	0				0			
140	51	8.4	37.5	92.5	0				1	3.0	95	149.5
150	58	9.6	51.5	101.8	0				0			
160	29	4.8	54	88.9	0				1	3.0	--	
170	22	3.6	65	90.6	0				4	12.1	148	134.4
180	30	4.9	84	97.9	0				5	20	159	117.8
190	20	3.3	94	89.1	0				1	3.0	200	126.9
200	28	4.6	108	108	0				0			
210	28	4.6	125	90.0	0				0			
220	30	4.9	115	85.8	2	67	140	86.1	0			
230	30	4.9	164	91.0	0				0			
240	40	6.6	194	94.8	1	33	200	105.2	0			
250	45	7.4	213.5	92.5	0				0			
260	25	4.1	224.5	86.7	0				0			
270	22	3.6	253	87.8	0				0			
280	4	.7	295	90	0				0			
290	9	1.5	330	90.2	0				0			
300	3	.5	323	81	0				0			
310	0				0				0			
320	0				0				0			
330	0				0				0			
340	0				0				0			
350	0				0				0			
360	0				0				0			
370	2	.3	729	74.6	0				0			
400	0				0				0			
410	0				0				0			
Total	606								33			

35

Table 8. Number, total lengths, weights, and relative weights of channel catfish, black crappie, and yellow perch collected July 8, 2003 from Hells Canyon Reservoir.

Total length	Channel catfish				Black crappie				Yellow perch			
	# coll.	% of total #	Avg. wt	Rel. wt	# coll.	% of total #	Avg. wt	Rel. wt	# coll.	% of total #	Avg. wt	Rel. wt
70	0				2	20						
80	0				1	10			2	17		
90	0				0				1	8.3		
100	0				0				0			
110	0				0				2	17		
120	0				0				0			
130	0				0				0			
140	0				0				0			
150	0				0				0			
160	0				0				0			
170	0				0				0			
180	2	4.3	47.5	93.3	0				1	8.3	90	104.1
190	3	6.5	93	151.8	2	20	111	129.0	0			
200	3	6.5	85	120.4	1	10	150	115.2	2	17	130	112.0
210	0				2	20	170	115.6	2	17	140	103.6
220	4	8.7	112.5	120.9	1	10	210	137.3	1	8.3	130	84.6
230	3	6.5	118	105.1	1	10	210	102.1	0			
240	2	4.3	132.5	106.1	0				0			
250	2	4.3	152.5	110.0	0				0			
260	1	2.2	135	83.3	0				1	8.3	220	84.7
270	3	6.5	143	81.5	0				0			
280	1	2.2	190	89.5	0				0			
290	1	2.2	240	110.6	0				0			
300	0				0				0			
310	1	2.2	285	100.4	0				0			
320	1	2.2	315	102.3	0				0			
330	1	2.2	325	93.8	0				0			
340	3	6.5	357	95.1	0				0			
350	0				0				0			
360	1	2.2	350	80.0	0				0			
370	1	2.2	530	107.9	0				0			
380	2	4.3	495	103.4	0				0			
390	1	2.2	560	95.5	0				0			
400	0				0				0			
410	1	2.2	695	100.2	0				0			
420	1	2.2	820	110.2	0				0			
430	0				0				0			
440	2	4.3	877.5	102.3	0				0			
450	2	4.3	940	102.3	0				0			
460	1	2.2	920	94.9	0				0			
470	1	2.2	1120	102.1	0				0			
480	1	2.2	1285	104.3	0				0			
490	0				0				0			
500	0				0				0			
510	0				0				0			
520	0				0				0			
530	0				0				0			
540	1	2.2	1600	95.3	0				0			

~~	0				0				0			
703	1	2.2	3604	94.0	0				0			
Total	46				10	10			12			

Table 9. Average back-calculated lengths for each age class of each fish species collected July 8, 2003 from Hells Canyon Reservoir.

Year class	Age	N	Back-calculation age														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Smallmouth bass																	
2002	1	10	75														
2001	2	30	73	129													
2000	3	23	74.5	135	194												
1999	4	19	73	135	185	227											
1998	5	22	79	138	185	216	247										
1997	6	1	111	180	241	301	343	370									
	7																
	8																
	9																
All classes			75	135	189	223	251	370									
N		105	105	95	65	42	23	1									
White crappie																	
All classes																	
N		42															
Bluegill																	
1997	1	0	0														
1996	2	0	0	0													
1995	3	7	48	79	126												
1994	4	23	50	81	122	159											
1993	5	5	44	72	111	138	164										
All classes			49	79	121	155	164										
N		35	35	35	35	28	5										

Table 9. Continued.

Year class	*Age*	N	Back-calculation age																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Channel catfish																							
2002	1	0																					
2001	2	0																					
2000	3	0																					
1999	4	4	77	129	173	198																	
1998	5	15	82	119	154	198	236																
1997	6	5	72	112	199	230	267	290															
1996	7	3	95	141	189	239	266	307	328														
1995	8	4	89	143	205	233	266	291	309	320													
1994	9	5	94	145	197	249	296	321	343	363	375												
1993	10	3	95	141	207	258	302	327	355	371	401	426											
1992	11	1	89	144	179	226	244	262	287	327	348	370	380										
1991	12	4	92	147	198	234	268	293	312	342	364	390	415	440									
1990	13	2	89	164	227	280	312	325	345	358	387	404	425	447	474								
1989	14	1	128	172	235	276	327	364	386	394	405	420	434	445	468	479							
1988	15	0																					
1987	16	0																					
1986	17	0																					
1985	18	1	115	236	261	306	321	336	346	351	361	372	402	422	467	537	577	618	658	698			
All Classes			87	135	186	227	266	307	332	351	378	401	414	440	471	508	577	618	658	698			
	N	48	48	48	48	48	44	29	24	21	17	12	9	8	4	2	1	1	1	1			
1982																							

LOST VALLEY RESERVOIR

INTRODUCTION

We gillnetted Lost Valley Reservoir to examine fishery changes since the last survey was completed in 1998. Yellow perch size and abundance were of particular interest due to their ability to over populate in this reservoir.

Methods

We set one floating and one sinking, standard lowland lake survey gill nets in Lost Valley Reservoir. Nets were set in the afternoon, fished all night and pulled the next morning. We collected length and weight data from all wild trout and a representative sample of hatchery trout and yellow perch.

Results

We collected a total of 40 hatchery released catchable size rainbow trout, 7 brook trout and 126 yellow perch. Twelve of the rainbow trout collected appeared to be holdovers from the 2002 stocking and averaged 356mm and 504 mm. Brook trout ranged from 235 to 184 mm and 45 to 125 g. A sample of 47 yellow perch were measured and weighed (Table 10).

Table 1. Length frequency, average weight, and relative weight of yellow perch collected from Lost Valley Reservoir on July 2, 2003.

	Yellow perch			
Total length	Number Measured	% of Total	Average Weight	Relative Weight
70	0	0		
80	0	0		
90	1	2	12	104.5
100	2	4	13	93.6
110	9	19	15	88.7
120	0	0		
130	1	2	34	103.7
140	4	9	38.5	91.7
150	9	19	45	91.0
160	13	28	49	84.7
170	7	15	56	81.0
180	0	0		
190	1	2	92	86.8
200	0	0		
Total	47	100		

LITERATURE CITED

Butts, A. 2004. Lake and Reservoir Research, Idaho Department of Fish and Game. Job Performance Report. Project F-73-R-25. Boise, Idaho.

2003 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-28

Project I: Surveys and Inventories

Subproject I-C: McCall Subregion

Job: b-2

Title: Lowland Lakes Investigations: Lake Cascade, Yellow Perch Investigations

Contract Period: January 1, 2003 to December 31, 2003

ABSTRACT

The recovery of yellow perch *Perca flavescens* populations in Lake Cascade appeared to be dependant on the significant reduction in the northern pikeminnow *Ptychocheilus oregonensis* population size. We began developing the Lake Cascade draining proposal that would virtually eliminate northern pikeminnow and largescale suckers *Catostomus macrocheilus* populations from Lake Cascade. We held meetings with public agencies, irrigators, user groups, and landowners. Media contacts were made to present the proposal and to gather input on concerns and support for the project.

We completed a reservoir wide Lincoln-Petersen Mark-Recapture population estimate of northern pikeminnow and largescale sucker. The final estimates were 24,413 +/- 7,089 adult northern pikeminnow (>250 mm) and 80,187 +/- 26,353 largescale sucker.

We completed an age and growth study of northern pikeminnow. Results indicated that 95% of the population was 11+ to 20+ years old.

We completed a hydroacoustic fish population survey in 2003. The total fish estimate for Lake Cascade was 106,508 $\pm$ 44,979 (95% CI). The northern pikeminnow estimate for fish greater than 250 mm was 42,108 $\pm$ 15,527

We continued yellow perch population monitoring in Lake Cascade. Sampling indicated that juvenile yellow perch continued to disappear by August of their second year. Total trawl catches were the lowest since monitoring began in 1998.

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LAKE CASCADE DRAINING PROPOSAL DEVELOPMENT

INTRODUCTION

The Department prioritized the restoration of the once popular yellow perch *Perca flavescens* fishery in Lake Cascade and during the last several years much effort was directed toward determining the cause of the yellow perch fishery collapse and identifying methods for fishery restoration. The primary cause was not identified but it was determined that predation by adult northern pikeminnow *Ptychocheilus oregonensis* on juvenile yellow perch limited recruitment and was preventing recovery (Allen et al. *In Review*). Various methods were investigated for reduction of northern pikeminnow. Physical trapping efforts in the tributary spawning streams over the last two years failed to remove adequate numbers of northern pikeminnow therefore, we continued to develop and investigate alternate techniques to reduce northern pikeminnow numbers in the reservoir. We examined the option to drain the reservoir as low as possible and then chemically remove all remaining fish. We initiated studies with the U.S. Bureau of Reclamation (USBOR) to determine the feasibility of draining the reservoir in one year and the probability of meeting all contractual water obligations upon draining and refill.

We developed the Lake Cascade draining and rotenone treatment proposal in winter/spring 2003. Meetings were held with the USBOR, Idaho Department of Environmental Quality, Idaho Department of Water Resources, Lake Cascade Watershed Advisory Group and Technical Advisory Committee, and Water District 65 irrigators to determine feasibility of, and concerns with, the proposal.

Public meetings, newspaper articles, television news stories, and a brochure was developed to disseminate information about the proposal and to collect comments, concerns and support for the proposal. Public meetings were held in McCall, Cascade, Boise, and Payette. The brochure was mailed to all Valley County property tax payers as well as other Lake Cascade user groups. A total of 16,500 brochures were printed and mailed.

Results

Resulting from the informal scoping meetings with several different federal and state agencies, user groups, and the general public, the USBOR made the decision that an Environmental Impact Statement (EIS) would be required to proceed with the IDFG draining proposal. The Department contracted the USBOR to first conduct reservoir drawdown modeling studies. The studies were to determine the effects of the Lake Cascade draining proposal on the surface waters and water rights accounting in the Payette River drainage. The water modeling studied the constraints of draining the reservoir in one year and meeting all consumptive water use contracts that year and the following years. The model was to develop probabilities of refilling the reservoir utilizing all past water year data. The Department also contracted the United States Forest Service, Reinvention Lab TEAMS to produce the EIS document and to oversee its development. Department staff, TEAMS and USBOR staff began the formal EIS public process in the summer of 2003.

LAKE CASCADE NORTHERN PIKEMINNOW AND LARGESCALE SUCKER POPULATION ESTIMATE

INTRODUCTION

The yellow perch fishery in Lake Cascade was described and its decline documented by Anderson et al. (2001). Reasons for the decline were investigated in 1998 through 2000, and results were presented in Anderson et al. 2001 and 2002, and Janssen et al. 2003. The investigations examined several possible causes for the dramatic decline and suggested that northern pikeminnow predation and/or disease were the probable causes. Post decline studies failed to find any consistent problematic disease agents in yellow perch and indicated that northern pikeminnow predation on yellow perch was preventing yellow perch recovery.

We completed northern pikeminnow population estimates and age composition and growth work in 2003 to examine predatory pressures on yellow perch. Because northern pikeminnow become piscivorous at 250 mm TL (Thompson 1959) (Rieman and Beamesderfer 1990), the population was divided into two categories, those fish equal to or greater than and less than 250 mm TL. We also completed a population estimate on largescale sucker *Catostomus macrocheilus* concurrently with the northern pikeminnow estimate since both would be collected in the sampling gear.

Methods

We captured northern pikeminnow and largescale sucker in Lake Cascade during spring and summer 2003 using Merwin trap nets (Figure 1). We used two types of Merwin traps in this study. Both were of the same basic design with only minor differences in dimensions and mesh size (Table 1). Four Merwin traps were placed around the reservoir in areas with a gradually sloping bottom, 30.5 m offshore in approximately 5.5-7.7 m of water with the lead attached to shore (Figure 2).

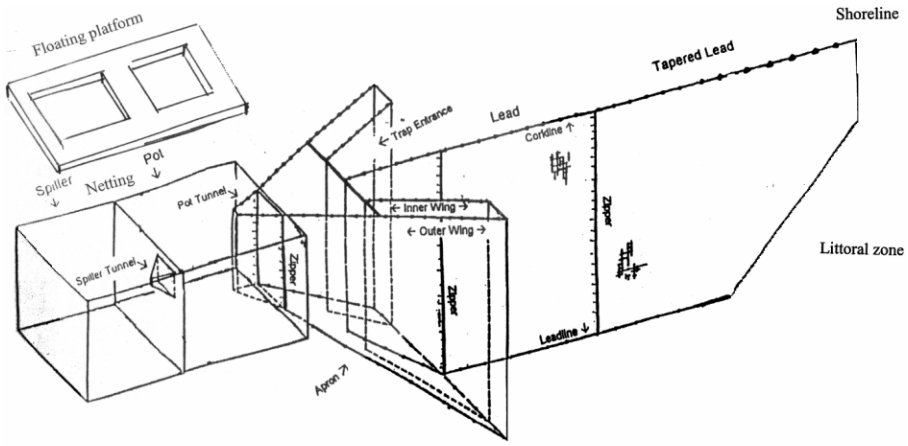

Figure 1. Merwin trap net schematic (University of Washington Mobile Trap Net Description and Procedures 1993).

Table 1. Merwin trap dimensions.

Traps 1 and 2		Traps 3 and 4	
Pot	2.67 m X 2.75 m X 4.88 m	Pot	2.44m X 2.44m X 5.49m
Spiller	3.28 m X 2.75 m X 4.88 m	Spiller	2.44m X 2.44m X 5.49m
Lead	30.48 m X 4.57 m	Lead	30.48m X 5.49m
Mesh	15 mm bar	Mesh	20 mm bar

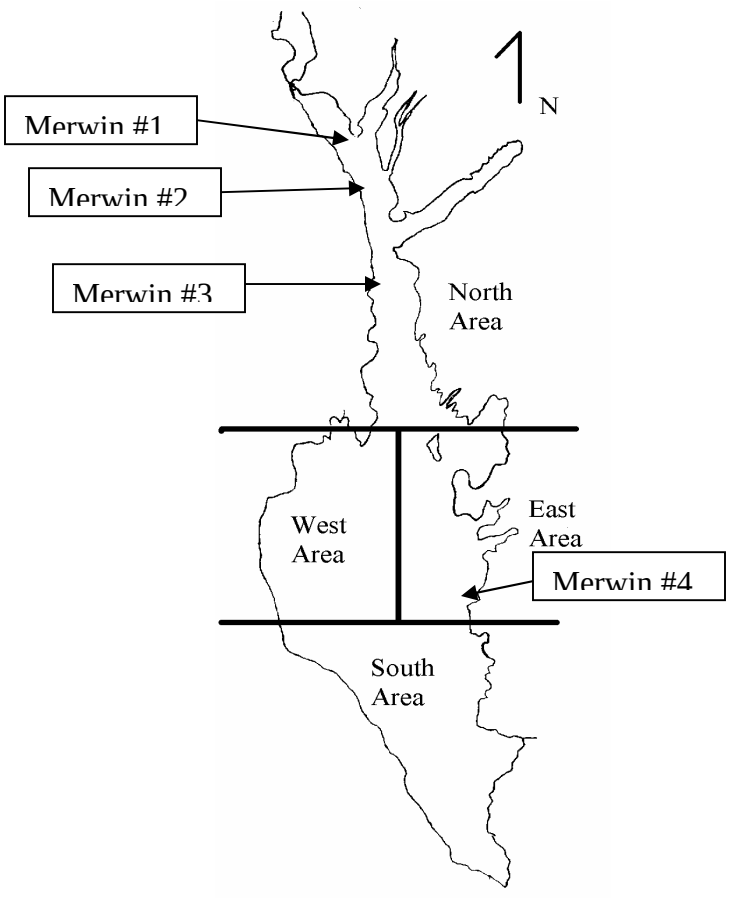

Figure 2. Merwin trap sample sites in Lake Cascade, 2003.

We removed all fish from the Merwin traps three times per week. Northern pikeminnow and largescale suckers were marked with a ventral fin clip, examined for sex and stage of sexual maturity, counted, and released. Northern pikeminnow less than 250 mm TL and equal to or greater than 250 mm TL were tallied separately.

We set a combination of forty-seven floating and sinking gill nets 17 July through 03 September in an effort to recapture marked fish. Nets were set in the afternoon and retrieved the following morning. Gill nets were distributed equally in each quarter of the reservoir (Figure 2).

Northern pikeminnow were removed from gill nets, checked for marks, measured, and killed to remove them from the population. Largescale sucker were also checked for marks and killed.

Due to an unexpectedly small population estimate resulting from the first recapture effort, a second gill netting recapture effort was made 16 October through 21 October. Thirty-three sample sites were randomly selected throughout the reservoir a priori, GPS waypoints were assigned, and gill nets were set at each site. Northern pikeminnow were checked for marks, measured to the nearest centimeter, and killed. Largescale sucker were also checked for marks and killed.

Population estimates were made for northern pikeminnow >250 mm, northern pikeminnow <250 mm, and all largescale sucker using the Lincoln-Petersen model with Chapman's correction (Ricker 1975). Initial population estimates were calculated using recapture data collected 17 July through 03 September. A second estimate was made for each group from recapture data collected 16 October through 21 October. Final estimates were made using recapture data collected 29 August through 21 October.

Results

We captured 6,550 fish in four Merwin traps operated for 260 trap-days. Traps 1, 2, 3, and 4 fished for 75, 69, 62, and 54 days respectively. Northern pikeminnow and largescale suckers made up 91% of the total catch (Figure 3). Trap 1 collected the most fish, averaging 29 northern pikeminnow and 21 largescale suckers per net-night followed by Trap 2 averaging 21 northern pikeminnow and 11.4 largescale suckers. Catch rates were lower in traps 3 and 4, averaging 2.7 and 3.9 northern pikeminnow and 3.2 and 5.3 largescale suckers, respectively, per net-night. Catch rates were highest for both species during periods of high activity prior to and immediately following presumed spawning migrations into the tributaries located at the north end of the reservoir (Figures 4-7). Length frequency of measured northern pikeminnow and largescale sucker, respectively are presented in Figures 8 and 9. Sex ratio of northern pikeminnow for Merwin trap 1 and 2 are presented in Figures 10 and 11.

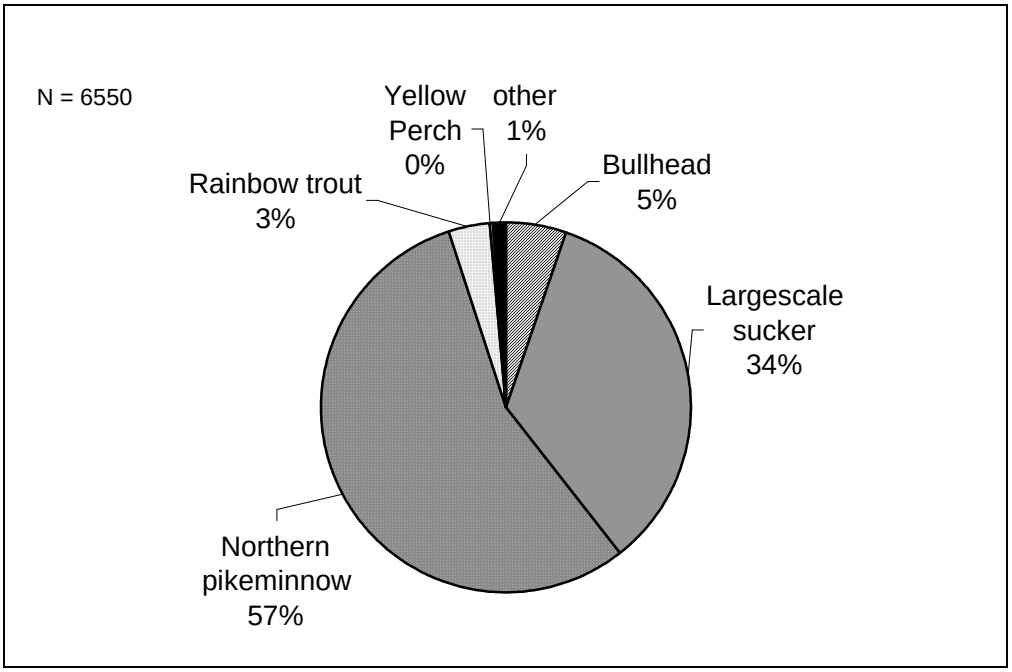

Figure 3. Species composition for all Merwin trap captures, Lake Cascade, 2003. (Species denoted as "other" include black crappie, coho, lake trout, pumpkinseed, smallmouth bass, tiger muskie, and mountain whitefish).

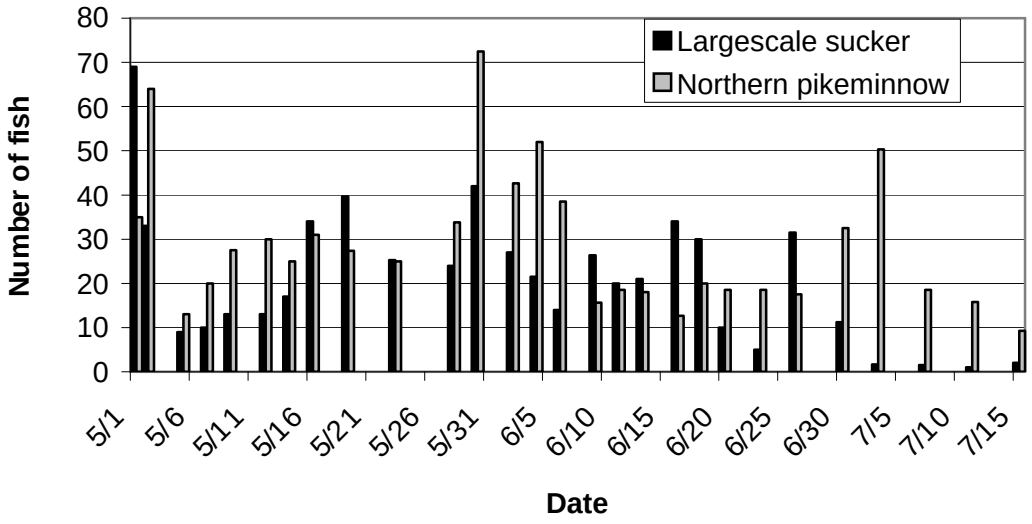

Figure 4. Catch per net-night for Merwin trap 1, Lake Cascade, 2003.

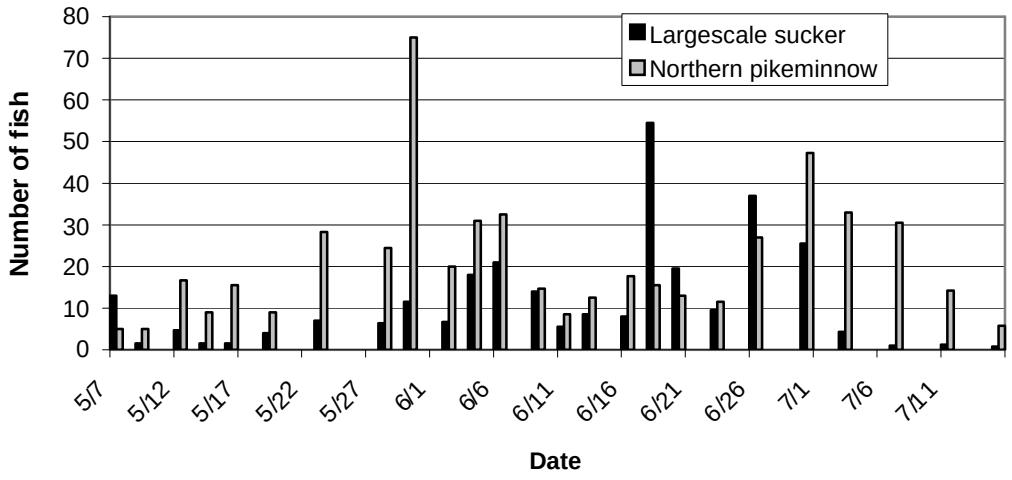

Figure 5. Catch per net-night for Merwin trap 2, Lake Cascade, 2003.

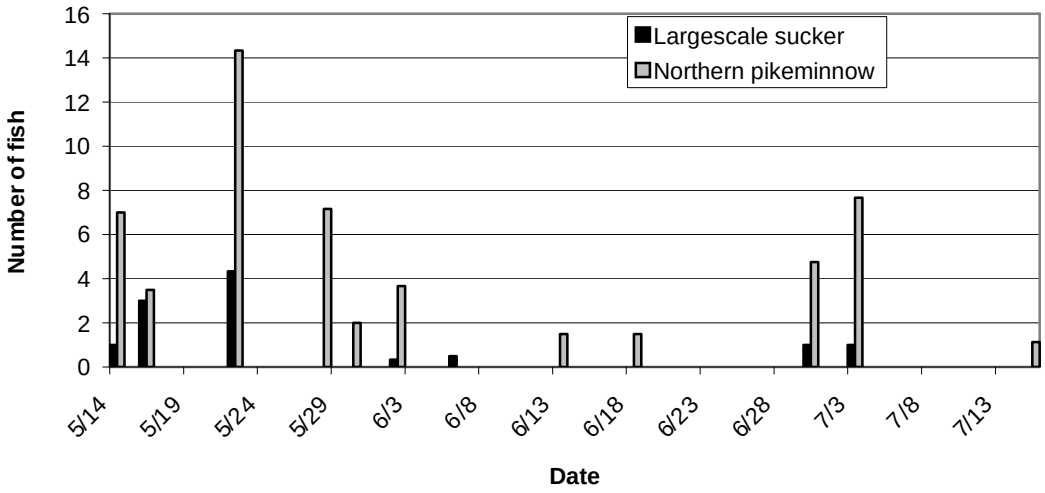

Figure 6. Catch per net-night for Merwin trap 3, Lake Cascade, 2003.

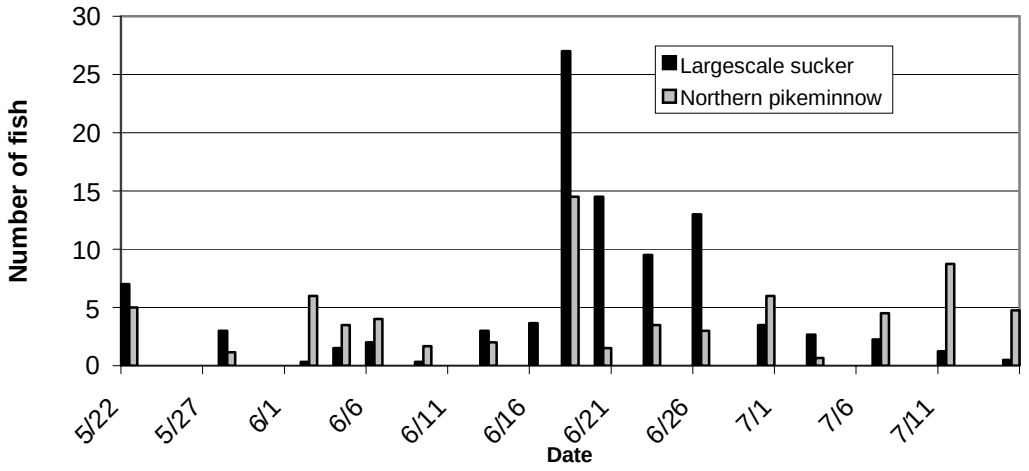

Figure 7. Catch per net-night for Merwin trap 4, Lake Cascade, 2003.

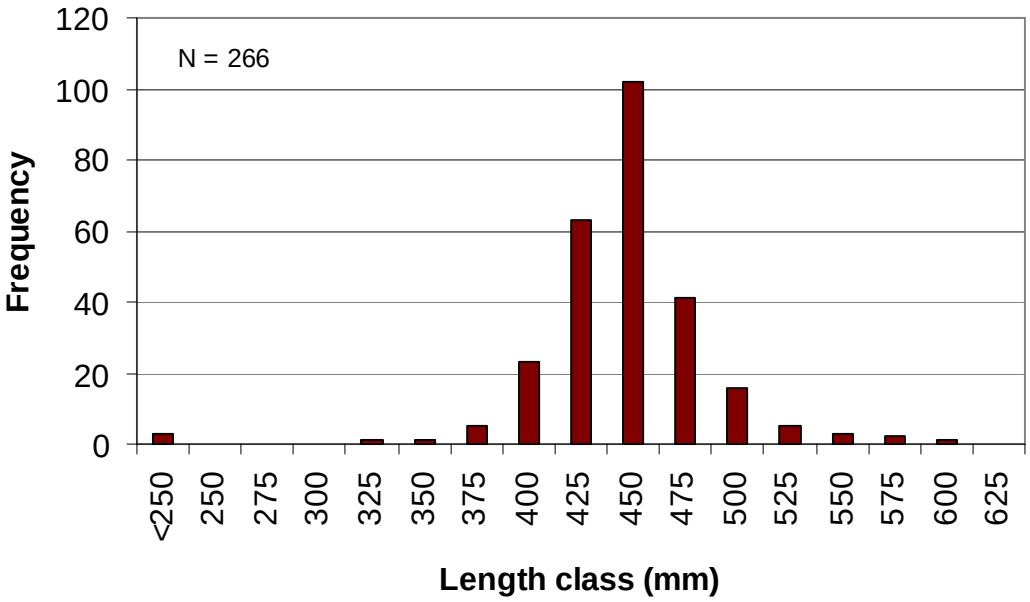

Figure 8. Northern pikeminnow length frequency, Lake Cascade Merwin traps, 2003.

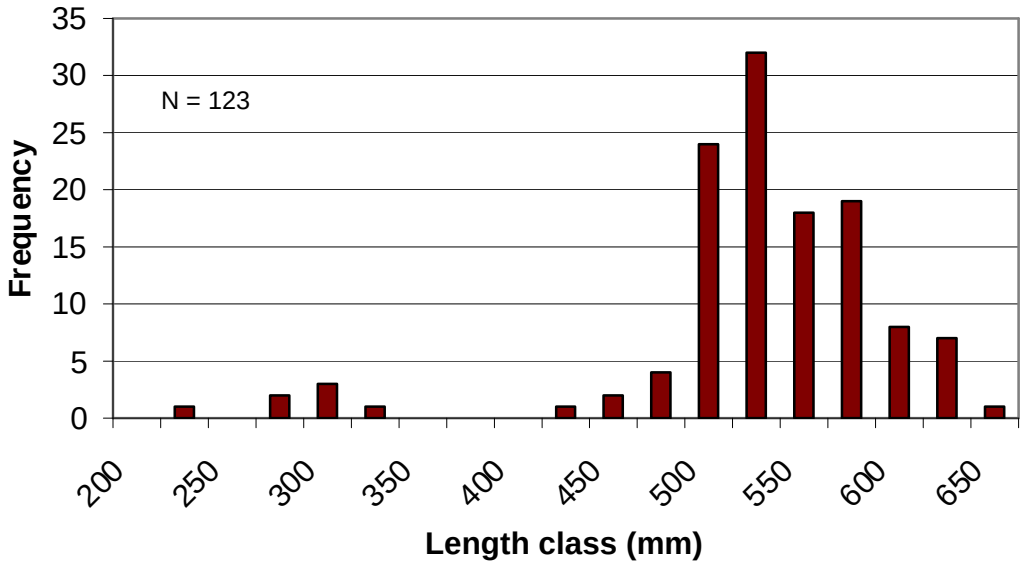

Figure 9. Largescale sucker length frequency, Lake Cascade Merwin traps, 2003.

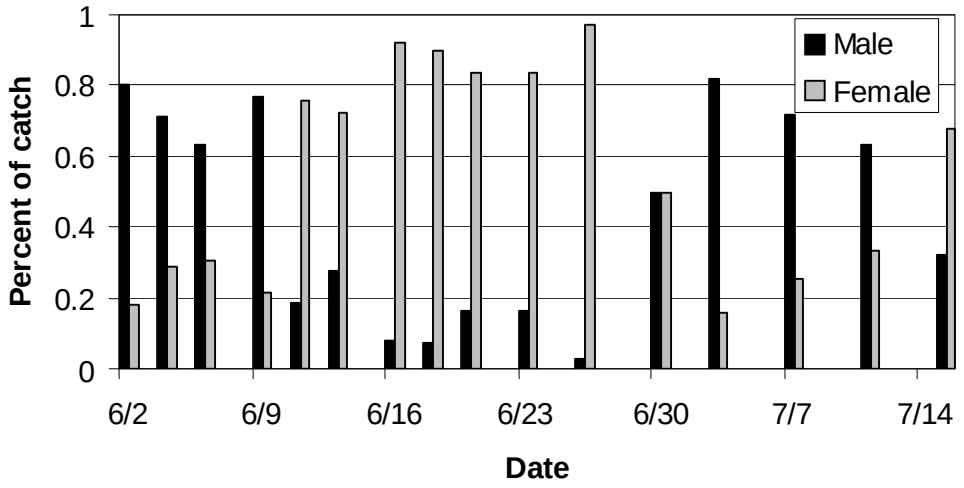

Figure 10. Northern pikeminnow sex ratio for Merwin trap 1, Lake Cascade, 2003

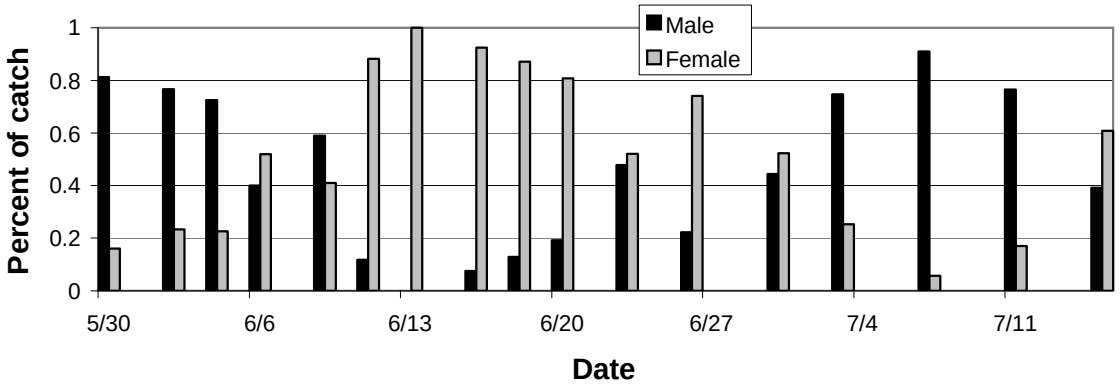

Figure 11. Northern pikeminnow sex ratios for Merwin trap 2, Lake Cascade, 2003.

We marked 3,547 northern pikeminnow >250 mm, 72 northern pikeminnow <250 mm, and 2,256 largescale sucker from fish captured in the four Merwin traps combined. Three marked northern pikeminnow >250 mm and 10 marked largescale sucker were later found dead, killed by otters, inside the traps. These were subtracted from the number of marked fish for population estimations. We considered mortality due to marking and handling negligible.

We set 80 gill nets from 17 July through 21 October, catching 1,662 fish comprising ten species. Sinking nets, averaged 9.9 northern pikeminnow and 7.6 largescale sucker per net-night, while floating nets averaged 3.3 northern pikeminnow and 0.9 largescale sucker (Figure 12).

Northern pikeminnow and largescale sucker dominated the catch, amounting to 71% of the total fish captured (Figure 13). We caught 644 northern pikeminnow >250 mm, 32 northern pikeminnow <250 mm, and 505 largescale sucker. Figure 14 presents the northern pikeminnow gill net length frequency. Of these, 65 northern pikeminnow >250 mm, one northern pikeminnow <250 mm, and 11 largescale sucker were recaptures.

The adult northern pikeminnow population (>250 mm) was initially estimated to be 40,517 +/- 11,706. No population estimate could be made for northern pikeminnow <250 mm for this period because there were no recaptures and the estimate for largescale sucker was N = 108,605 +/- 79,619.

The second recapture effort resulted in an estimate of 23,847 +/- 8,308 adult northern pikeminnow. The two population estimates were not statistically different, but we did notice a gradual increase in the ratio of recaptures to unmarked fish after 19 August. From 17 July to 19 August, gill net captures averaged one recapture per 10.3 northern pikeminnow >250 mm caught.

During the second recapture effort from 16 October through 21 October, gill nets averaged one recapture per 7.0 adult northern pikeminnow, making it appear likely that marked fish had not completely mixed with the unmarked portion of the population until after 19 August. This second estimate resulted in a population estimate of 23,847 +/- 8,308, +/- 117, and 69,502 +/-47,379 for northern pikeminnow >250 mm, northern pikeminnow <250 mm, and largescale sucker respectively.

From 29 August to 21 October, gill net captures averaged one recapture per 7.1 adult northern pikeminnow. This ratio is very close to that of the second recapture attempt so data from these dates were pooled for use in the final population estimate to maximize the sample size. The result was a final population estimate of N = 24,413 +/- 7,089 while the population estimate for northern pikeminnow <250 mm did not change. The largescale sucker population was estimated to be N = 80,187 +/- 26,353. We can be 95% confident that these estimates deviates no more than 25% from the true value of N (Robson and Regier 1964, Ricker 1975).

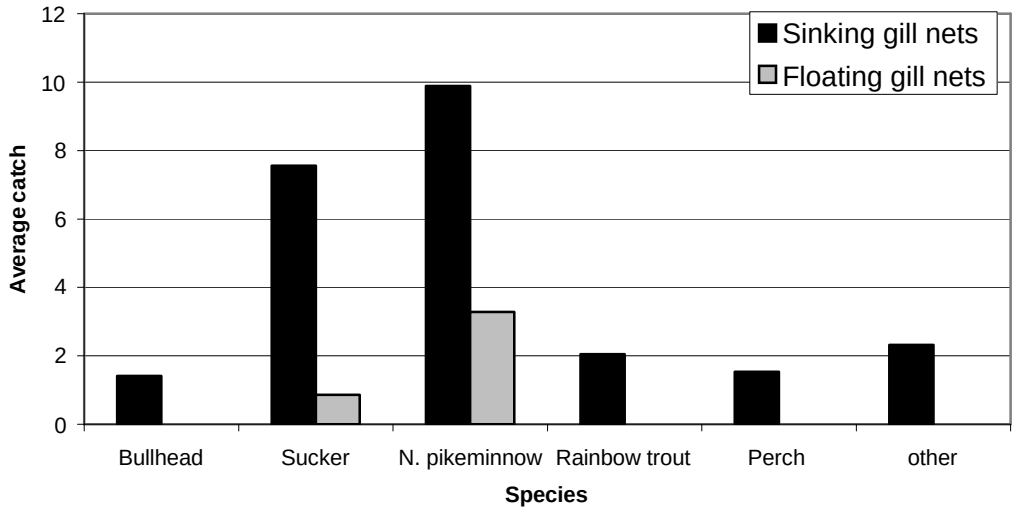

Figure 12. Average catch per net-night by species for gill nets, Lake Cascade, 2003. Species denoted as "other" include black crappie, coho, kokanee, pumpkinseed, smallmouth bass and mountain whitefish.

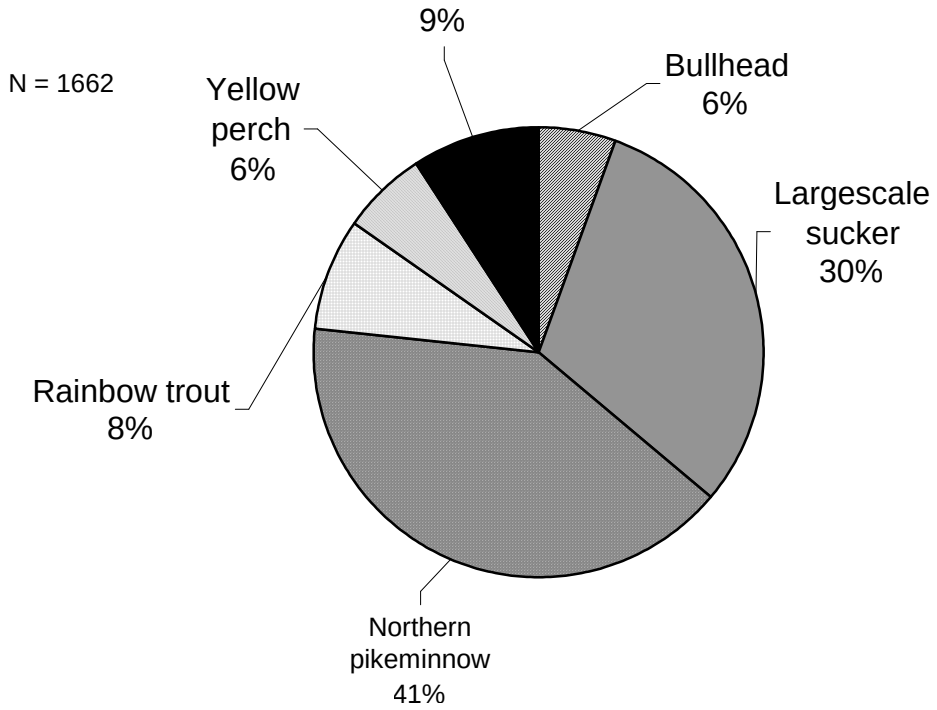

Figure 13. Species composition of all fish captured in gill nets, Lake Cascade, 2003. Species denoted as "other" include black crappie, coho, kokanee, pumpkinseed, smallmouth bass, and mountain whitefish.

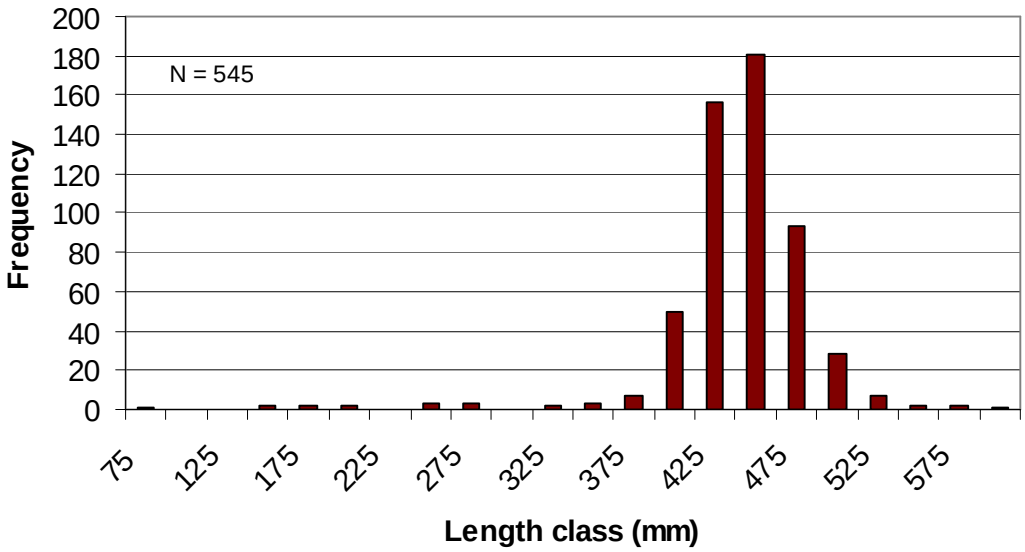

Figure 14. Northern pikeminnow length frequency, Lake Cascade gill nets, 2003.

DISCUSSION

Northern pikeminnow and largescale suckers accounted for 41% and 30% respectively of the total gill net catch. Despite this domination of catch by adult northern pikeminnow, the population estimate was much lower than expected. Hydroacoustic population estimates have ranged from 24,000 to 240,000 in past years, and Anderson et al. (2002), using gill net data and hydroacoustic survey results, estimated that the population might be as large as N = 500,000. However, despite being a small population, we found 98% of northern pikeminnow to be large enough to consume primarily fish if given the opportunity (> 250 mm, Rieman and Beamesderfer 1990).

Both northern pikeminnow and largescale sucker appear to have made movements toward the north end of Lake Cascade prior to spawning. This was reflected in catch rates over time in the two Merwin traps placed in that vicinity (Figures 4 and 5). Largescale sucker began spawning in early May and finished by early June. The northern pikeminnow spawning run lasted from early June through mid-July.

Northern pikeminnow males were present in large numbers in the northern area of the reservoir from early June when sampling began until 11 June, at which time they nearly disappeared from the catch, presumably into the tributaries to spawn (Figures 10 and 11). They began returning around 30 June. Large numbers of female northern pikeminnow moved into the area somewhat later than males, around 11 June. Females appear to have left the area around 30 June and returned by 15 July. These movements match closely those reported in Lake Cascade by Casey (1962) in which he documented large spawning runs into the North Fork Payette River in 1957 and 1958. It appears that the majority of spawning still takes place in the tributaries with no spawning documented in the reservoir.

RECOMMENDATIONS

The unexpectedly small number of northern pikeminnow in Lake Cascade and the evidence that most of the adults were still spawning in the N. F. Payette River may provide an unexpected opportunity to reduce their numbers through eradication in both the river and the reservoir. Bioenergetics modeling should be completed to examine possible effects of northern pikeminnow population reduction on the yellow perch recovery effort. Modeling should also be used to estimate the number of adult yellow perch needed by size to overcome predation by the existing northern pikeminnow population and allow for a yellow perch recovery.

NORTHERN PIKEMINNOW AGE AND GROWTH STUDY

INTRODUCTION

The skewed length frequencies observed in the Merwin traps and gill net catches prompted us to look at age and growth of the current northern pikeminnow population.

Methods

Total length was measured to the nearest millimeter and weight was measured to the nearest gram. Very few northern pikeminnow less than 250 mm were collected from the reservoir so small fish from the North Fork Payette River collected on 02 September above Lake Cascade and below the reservoir on 24 September were supplemented for age and growth purposes. These fish were assumed to be of the same genetic population.

We removed otoliths from 25 northern pikeminnow collected with gill nets from the reservoir on 29 August. Otoliths and opercles were collected from 29 northern pikeminnow captured in the North Fork Payette River on 02 September and from 56 northern pikeminnow captured in the reservoir on 03 September.

Otoliths were placed in a layer of epoxy and allowed to dry and then sectioned using a rotary power tool and abrasive disk. Otoliths were sanded until thin enough that individual annuli could be distinguished with the dissecting scope and then mounted on slides. Opercles were placed in boiling water for five minutes allowing for the removal of all tissue covering the bone. A dissecting microscope was used to read annuli on both otoliths and opercles.

Results

Fifty-six northern pikeminnow from Lake Cascade and 31 from the North Fork Payette River were aged by counting annuli on opercles. An additional 25 northern pikeminnow from Lake Cascade were aged using otoliths. Five of the fifty-six fish from Lake Cascade that were aged using opercles were also aged using otoliths to compare the two methods. Three of the five northern pikeminnow were found to be the same age using both methods. One fish was

found to be two years older when aged with otoliths rather than opercles. The last was found to be one year older using otoliths.

Northern pikeminnow collected from the North Fork Payette River ranged from age 0+ to 2+ and were 30 to 167 mm TL. Those collected from the reservoir ranged from 3+ to 20+ years and were 180 to 530 mm TL (Figure 15). However, most northern pikeminnow (78 of 86) from the reservoir were more than 11 years old and >400 mm TL. Only five percent of northern pikeminnow from gill net samples and two percent captured in Merwin traps were <400 mm TL. Likewise, only six percent of largescale sucker captured in Merwin traps were <400 mm TL.

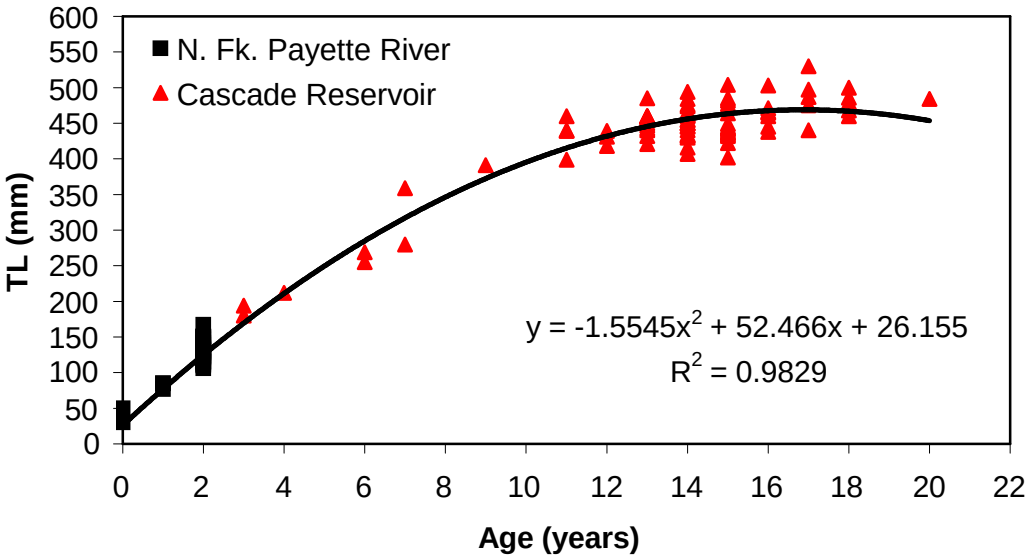

Figure 15. Total length at age for northern pikeminnow in the Lake Cascade system, 2003.

DISCUSSION

Despite a difference of one to two years in five of the fish aged using opercles versus otoliths, there is no doubt that the reservoir population is quite old. Ninety-four percent of largescale suckers collected in gill nets were >400 mm TL as well, and it can be assumed that this population is also made up of old fish. It appears that there has been little to no recruitment of either species in the reservoir in the last ten years.

It appears that the very large number of northern pikeminnow in the early 1990's consumed virtually all young-of-year and yearling, northern pikeminnow and largescale sucker as well as yellow perch. Therefore, there has been insufficient recruitment of northern pikeminnow for the last several years resulting in a significant crash in the northern pikeminnow population in recent years due primarily to natural mortality (age).

LAKE CASCADE HYDROACOUSTIC FISH POPULATION ESTIMATE

INTRODUCTION

We completed a hydroacoustic fish survey and population estimates of several fish species present in Lake Cascade in 2003.

Methods

We utilized the Department hyrdroacoustic research project crew to estimate fish populations by species in the lake. Butts (*in review*) presented a description of the equipment and methodology used. We completed one hydroacoustic survey in 2003.

Results

The total fish abundance estimate for Lake Cascade was 106,508 $\pm$ 44,979 (95% CI). The northern pikeminnow estimate for fish greater than 250 mm was 42,108 $\pm$ 15,527 (Butts *in review*). An in-depth report of the results was presented in Butts (*in review*).

YELLOW PERCH POPULATION MONITORING

INTRODUCTION

We continued our annual yellow perch population trend monitoring in 2003.

Methods

We repeated the trawling effort and methodology developed in 1998 and 1999 and described by Janssen et al. (2003) and Anderson et al. (2001). We counted all yellow perch collected and a representative sample of yellow perch from each sample area was measured in total length to the nearest 1 mm and weighed to the nearest 0.1 g.

Results

We completed 67 trawling transects in 2003, fishing the trawl for 370 minutes, collecting 113 yellow perch. We averaged .04, 2.38 and 2.20 yellow perch per five minute transect in June, August and October respectively. Trawling transect locations in 2003 were established in 1998 and 1999 and are presented in Janssen et al. (2003). Catch rates in June were very low and as in other recent years dominated by Age-1 yellow perch. Age-0 yellow perch also dominated trawl catches in August and October 2003 (Figures 16,17 and 18). As in the past three years, age-1 yellow perch (2001 cohort) had virtually disappeared by the August trawling sample.

Yellow perch catch rates were highest in October, 98.3% of which were age-0. We collected more fish in the East and West sections during October than in the other areas and months sampled. However due to large variability in catch per trawl transect none of the values between areas were significantly different (95% CI) (Table 2). Catches/trawl transect were widely variable in all months and areas. Trawling in the north area was difficult due to the large number of submerged stumps and low water conditions that resulted in fewer transects being completed.

Table 2. Total and mean catch per 5 minute trawl of yellow perch with 95% confidence intervals (+/-) by area in June, August and October, 2003.

Sample Month	AREA											
	South			East		West				North		
	# Perch	Average Catch/ 5 min. trawl (+/- 95% CI)	# Transects	# Perch	Average Catch/ 5 min. trawl (+/- 95% CI)	# Transects	# Perch	Average Catch/ 5 min. trawl (+/- 95% CI)	# Transects	# Perch	Average Catch/ 5 min. trawl (+/- 95% CI)	# Transects
June	1	0.14	7	0	0	7	0	0	7	0	0	4
August	4	0.57 (.53)	7	12	2 (4.6)	6	17	2.43 (4.8)	7	24	6 (12.8)	4
October	10	1.43 (2.1)	7	18	2.6 (5.1)	7	24	3.43 (3.3)	7	3	0.75 (2.4)	4

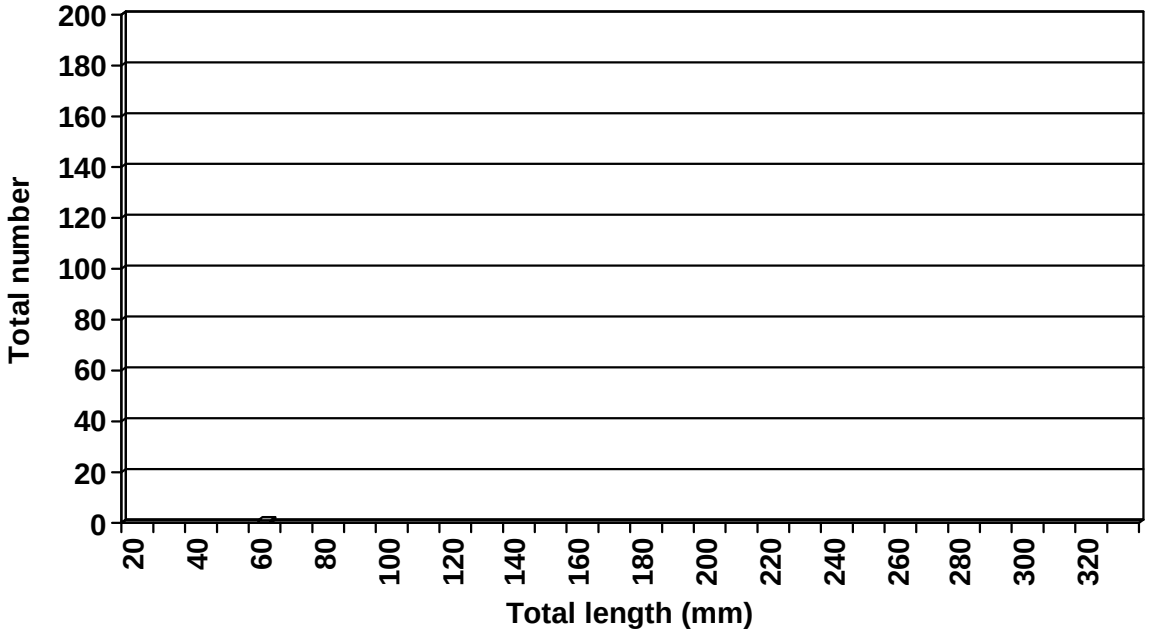

Figure 16. Length frequencies (catch/370 minutes of effort) of yellow perch collected with a bottom trawl from Lake Cascade, June 2003.

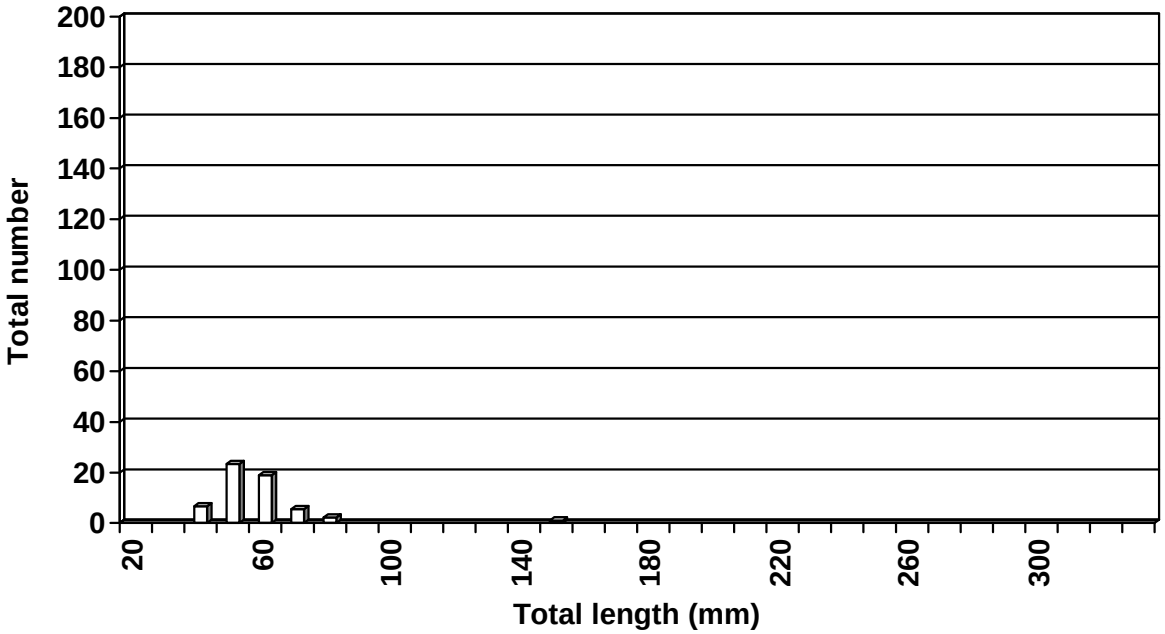

Figure 17. Length frequencies (catch/370 minutes of effort) of yellow perch collected with a bottom trawl from Lake Cascade, August 2003.

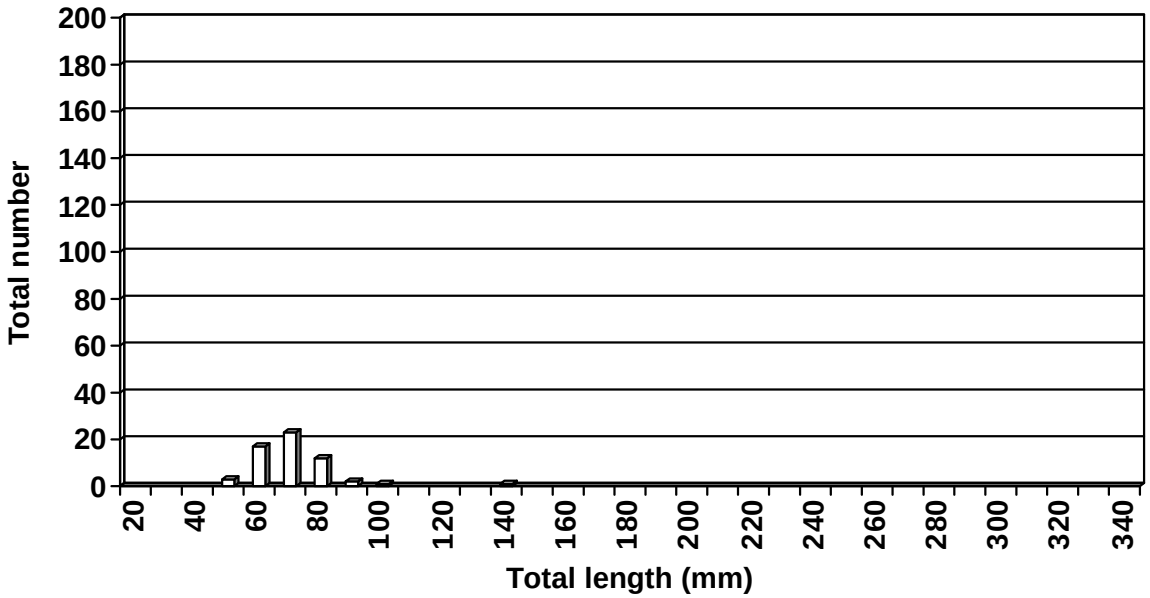

Figure 18. Length frequencies (catch/370 minutes of effort) of yellow perch collected with a bottom trawl from Lake Cascade in October 2003.

LITERATURE CITED

Allen, D., P.J. Janssen, and K. Apperson. In review. Regional fishery management investigations. Federal aid in fish restoration. 2002 Job performance report, Program F-71-R-27. Idaho Department of Fish and Game, Boise.

Anderson D. P. J. Janssen, K. Apperson and L Hostettler. 2001. Regional fishery management investigations. Federal aid in fish restoration. 1998 Job performance report, Program F-71-R-23. Idaho Department of Fish and Game, Boise.

Anderson, D., P.J. Janssen, K. Apperson, and L. Hostettler. 2002. Regional fishery management investigations. Federal aid in fish restoration. 2000 Job performance report, Program F-71-R-25. Idaho Department of Fish and Game, Boise.

Butts, Arthur E. *In review*. Lake and reservoir research. Job performance report. Program F-73-R-26. Project 5. Report period July 1, 2003 to June 30, 2004. Idaho Department of Fish and Game, Boise.

Casey, O.E. 1962. The life history of the northern squawfish in Cascade Reservoir. Master's thesis. University of Idaho.

Janssen, P.J., D.Allen, and K. Apperson. 2003. Regional fishery management investigations. Federal aid in fish restoration. 1999 Job performance report, Program F-71-R-24. Idaho Department of Fish and Game, Boise.

Janssen, P.J., D.Allen, and K. Apperson. 2003. Regional fishery management investigations. Federal aid in fish restoration. 2001 Job performance report, Program F-71-R-26. Idaho Department of Fish and Game, Boise.

Ricker, W.E. 1975. Computation and interpretation of biological statistics of fish populations. Bulletin 191 of the Fisheries Research Board of Canada. Department of the Environment, Fisheries and Marine Service.

Rieman, W.E. and R.C. Beamesderfer. 1990. Dynamics of a northern pikeminnow population and the potential to reduce predation on juvenile salmonids in a Columbia River reservoir. North American Journal of Fisheries Management. 10:228-241.

Robson, D.S. and H.A. Regier. 1964. Sample size in Petersen mark-recapture experiments. Transactions of the American Fisheries Society 93:215-226.

Thompson, R.B. 1959. Food of the squawfish Ptychocheilus oregonensis (Richardson) of the lower Columbia River. U.S. Fish and Wildlife Service Bulletin 60:43-58.

2003 ANNUAL PERFORMANCE REPORT

State of: Idaho | Program: Fisheries Management

Project I: Surveys and Inventories | Subproject I-C: Southwest Region (McCall)

Job: c | Title: Rivers and Streams Investigations

Contract Period: January 1, 2003 to December 31, 2003

ABSTRACT

The 2003 kokanee *Oncorhynchus nerka kennerlyi* spawning run in the North Fork Payette River above Payette Lake was estimated to be 9,394 fish.

The North Fork Payette River was sampled with boat electrofishing techniques from the City of Cascade to below Smiths Ferry. The fish population was dominated by nongame fish species.

Temperature recorders monitored the upper Little Salmon River drainage throughout the summer of 2003. Mean daily temperatures peaked in mid-July at 22 to 23^{o}C. Stream temperature monitored in the North Fork Payette River upstream from Payette Lake recorded mean daily temperatures that peaked at 20^{o}C on only three days throughout the summer.

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NORTH FORK PAYETTE RIVER ABOVE PAYETTE LAKE

INTRODUCTION

The spawning run of kokanee *Oncorhynchus nerka kennerlyi* in the North Fork Payette River (NFPR) from Payette Lake has been enumerated since 1988 to assess spawning escapement and to serve as a method of validating kokanee population/density estimates and survival estimates from in-lake population work. (See Lowland Lakes section of this report). This estimate was completed again in 2003.

Methods

We completed kokanee spawner counts by walking the entire stretch of river utilized by spawning kokanee and counting all live spawners. The total spawning run estimate was made by multiplying the largest daily count by 1.73 (Frost and Bennett, 1994). A sample of adult spawners was collected and each fish was measured to the nearest 1 mm to fork length and weighed to the nearest 1 g.

Results

Kokanee spawners were counted three times from September 1 through September 9, 2003. The peak count of 5,430 live fish was made on September 9, 2003 (Table 1). The total spawning run estimate was 9,394 (5,430*1.73) fish. This was the lowest spawner count since the first count in 1988. Average length and weight of spawners was 293 mm and 279 g.

Table 1. Estimated total kokanee spawning run size and biomass from 1988 through 2003 from Payette Lake.

Year	Peak Count	Estimated # Spawners	KG/Lake HA[1]	Number Lake HA[1]	Average Weight (g)
1988	13,200	22,800	4.6	13.3	346
1989	8,400	14,500	2.9	8.4	349
1990	9,642	16,700	3.5	9.7	358
1991	10,400	18,000	5.3	10.5	505
1992	16,945	29,300	6.4	17.1	377
1993	34,994	59,310[a]	8.5	34.6	245
1994	25,550	44,200	5.5	25.8	214 [b]
1995	32,050	55,450	4.8	32.3	147
1996	35,090	60,707	5.7	35.4	162 [c]
1997	36,300[e]	64,891[d]	5.6	37.8	148
1998	14,585	25,232	2.1	14.7	143
1999	15,590	26,971	2.9	15.7	184
2000	15,520	26,850	2.9	15.6	188.5
2001	15,690[e]	30,144[f]	4.4	17.6	250.5
2002	9,430	16,314	--	9.5	--
2003	5,430	9,394	1.5	5.5	279

[1] 1,717 ha usable kokanee habitat in Payette Lake (Area w/depth greater than 40').
[a] Estimate made from stream and weir counts (Frost and Bennett, 1994)
[b] From gill net data of captured spawners in Payette Lake during lake survey.
[c] From trawling collections made in September 1996.
[d] Includes 2,092 fish spawned and killed by Nampa Fish Hatchery.
[e] Does not include 3,000 fish spawned and killed by Nampa Fish Hatchery.
[f] Includes 3,000 fish spawned and killed by Nampa Fish Hatchery.

NORTH FORK PAYETTE RIVER ELECTROFISHING SURVEY

INTRODUCTION

An electrofishing survey utilizing drift boats or raft modified to collect fish was conducted on the North Fork Payette River downstream from Lake Cascade Dam to below Smiths Ferry in September 2003. The survey was the first attempt to collect baseline fisheries data in these river reaches. The objective was to document the current fish species assemblages for the planned Environmental Impact Statement for draining Lake Cascade being prepared for the USBOR.

Sampling was divided into four sections related to access points for conducting the survey. Section 1 was from the north Highway 55 bridge to the south Highway 55 bridge in the City of Cascade, approximately 3 miles. Section 2 was from the south Highway 55 bridge in Cascade to the Carbarton Road bridge, approximately 11.5 miles. Section 3 was the canyon stretch from Carbarton bridge to the Smiths Ferry bridge, approximately 11.5 miles. Section 4 started at the Smiths Ferry bridge to a Highway 55 pullout, approximately 2.9 miles downstream.

In Sections 1, 2 and 4 two aluminum drift boats modified to collect fish with electrofishing equipment were utilized. In Section 3 a whitewater raft was modified for fish collection and a second raft accompanied for safety reasons. Each boat had two booms and ring droppers suspended off the front and utilized a negative dropper array from the boat to complete the circuit. One boat used a Coffelt VVP-15 and the other a Coffelt 2c pulsator and gas generators. One oarsman and one fish collector occupied each boat. Each boat collected fish from opposite riverbanks. The front crewmember used a foot control switch to energize the water and a long handed dipnet to capture fish. All fish encountered were collected. Periodically crews stopped and identified the sample to species, counted, measured and released the fish. Distance and energized time were recorded.

RESULTS AND DISCUSSION

Section 1- City of Cascade

This section was sampled on September 23, 2003 in the City of Cascade from the upper to lower Highway 55 bridge. A total of 6300 seconds of energized time was used between two boats to capture fish in this section. The length frequency of fish species captured is presented in Table 2. Most of the fish collected tended to be younger aged fish. Only seven rainbow trout *Oncorhynchus mykiss* were captured in the 3-mile section. Nongame species count are reported in Table 3. Habitat was composed of sand and mud substrates. Aquatic vegetation was common in the first mile. Overall the fish habitat was poor.

Section 2- Cascade to Carbarton Road

This sample section was completed on September 25, 2003 and started at the southern Highway 55 bridge and stopped at the Carbarton Road bridge approximately 11.5 miles downstream. Three sections of the total stretch were sampled for approximately 7800 seconds between the two boats. The length frequency of fish species is reported in Table 4 and species counts are reported in Table 3. Again the capture of rainbow trout was low with only eight rainbow trout captured. The substrate was composed almost entirely of sand. Many logjams were present especially in large river bends. The riparian habitat was poor, largely overgrazed by cattle with little exclusion fencing. Overall the fish habitat was highly impacted from sand and water management.

Section 3- Carbarton Road to Smiths Ferry

This is the recreational rafting section of the NFPR and was sampled on October 1, 2003 with one raft collecting fish species. An estimated 5400 seconds of energized time was used to collect the length frequency data and counts in Tables 5 and 3. Rainbow trout capture was low with only 12 rainbow trout captured in the sample. Much of the sample reach was not electrofished for safety reasons due to fast water and rapids. Habitat was poor being almost all sand substrate in the upper reach. River cobbles and boulders began to appear in the lower section's faster waters.

Anderson et al. 1987 reported higher numbers of rainbow trout than were observed in this survey. The previous survey captured all rainbow trout via angling and over a longer time period. Average rainbow trout lengths were larger in Anderson et al. 1987. Since the late 1980's this section use has increased tremendously in recreational rafting and incidental fishing.

Section 4- Smiths Ferry

This sample section was completed on September 24, 2003 and began at the County bridge at Smiths Ferry downstream approximately 2.9 miles to a shore pullout spot. An estimated 6200 seconds of energized time was used to collect the fish species reported in Table 6 and Table 3. No rainbow trout were collected in this section. Habitat is poor with the substrate composed entirely of sand. The fish habitat is composed of shifting sandbars in this section of the NFPR.

Table 2. Fish length frequency by cm group collected on 9/23/2003 by electrofishing in the North Fork Payette River in Section 1- City of Cascade.

Total Length Cm group	Mountain whitefish number	Northern pikeminnow number	Largescale sucker number	Bridgelip sucker number	Rainbow trout number	Smallmouth bass number	Yellow perch number
70			17			6	18
80		1	19	1		6	36
90			20	2		5	21
100	8	1	5			6	10
110	10	4	3			1	4
120	32	6					1
130	32	8		1		2	1
140	42	2				3	5
150	36	3		1		1	3
160	18		1		1	2	3
170	3	1	3	2		3	1
180			7	2		1	1
190			14				2
200		1	9	3			
210			14	8			
220			4	9			
230		1		9			
240				2			
250	1			3			
260			1				
270			1				
280	1			1			
290	2						
300	7				1		
310	7						
320	9						
330	4		1				
340	16				1		
350	6				2		
360	6				1		
370	5						
380	2						
390	6						
400							
410							
420					1		
430			1		1		
440			1				
450			1				
460			1				
470		1	1				
480							
490			1				
500			3				
510			1				
520			1				
530			2				
540			1				
550			2				
560			2				
570			3				
580			1				

Table 3. Counts of fish species not included in the length frequency of electrofishing catch in the North Fork Payette River below Cascade, Idaho collected in 2003.

Species	**Section 1 Cascade City**	**Section 2 Lower bridge to Carbarton**	**Section 3 Carbarton to Smith's Ferry**	**Section 4 Smith's Ferry**
Yellow perch		60		
Redside shiner	103	40	18	164
Dace spp	130	65	199	170
Sculpin spp	2	4	48	29
Sucker spp		318	22	

Table 4. Fish length frequency by cm group collected on 9/25/2003 by electrofishing in the North Fork Payette River in Section 2-Cascade to Carbarton Road.

Total Length Cm group	Mountain whitefish number	Northern pikeminnow number	Largescale sucker number	Bridgelip sucker number	Rainbow trout number	Smallmouth bass number
70		1				
80						
90		5				
100		4				
110	4	4				
120	7	3		3		
130	8	2	1	2	1	
140	13	3	7	1		
150	4		15			
160	2	1	13	1		
170	1	2	15	1		
180	1		24			
190	1		27	2		
200	1		10	2		
210	1		6			
220	1		3	3		
230			1	3		
240					1	
250	4	1	2	2		
260			1			
270						
280	1		1			
290	1				3	
300	5				1	
310	8					
320	4					
330	7					
340	10					
350	10					
360	10					
370	10	2				
380	6					
390	2					
400					1	
410	1					
420						
430					1	
440						
450						
460						
470						
480						
490						
500						
510						
520						
530						
540						
550						
560						

Table 5. Fish length frequency by cm group collected on 10/1/2003 by electrofishing in the North Fork Payette River in Section3-Carbarton to Smiths Ferry.

Total Length Cm group	Mountain whitefish number	Northern pikeminnow number	Largescale sucker number	Bridgelip sucker number	Rainbow trout number	Smallmouth bass number
70			1			
80						
90				1		
100	1			2		
110	1			9		
120	10	2		7		
130	23		1	5		1
140	22	2	1	5		
150	6		2	2		
160			2	7		1
170		1	4	2	1	
180			1	2		
190			1	4	1	
200	1			4	1	
210	4			6	2	
220	3	1		1		
230	4	1		5	1	
240	5			4	1	
250	2			5		
260	5				2	
270	6			3	1	
280	4		2	2		
290	7					
300	5				1	
310	10			1		
320	7				1	
330	9					
340	3					
350	8					
360	3					
370	4					
380	1					
390						
400						
410						
420						
430						

Table 6. Fish length by cm group collected on 9/24/2003 by electrofishing in the North Fork Payette River in Section 4- Smiths Ferry.

Total Length Cm group	Mountain whitefish number	Northern pikeminnow number	Largescale sucker number	Bridgelip sucker number	Rainbow trout number	Smallmouth bass number
70		3				
80						
90						
100	1	1				
110	7					
120	8		1	1		
130	4	1				
140	1		1	1		
150			3			
160			1			
170		1	1			
180			3			
190			1			
200						
210	1					
220	2					
230	1					
240						
250	3			1		
260				3		
270	1			2		
280						
290						
300						
310						
320				1		
330						
340						
350						
360						
370						
380	1					
390						
400						
410						
420			1			
430						
440						
450			3			
460						
470						
480			3			
490			4			
500			2			
510						
520			1			
530						
540						
550			2			
560			2			
570			2			
580						
590						
600			2			

TEMPERATURE MONITORING

INTRODUCTION

The upper Little Salmon River (LSR) drainage is the focus of ongoing riparian habitat improvement projects, and some improvements in agricultural land use practices. Debate has risen among stakeholders regarding what specific factors limit salmonid populations throughout the drainage. The effect of high summer water temperature as a factor limiting salmonid abundance and distribution in the drainage is unknown. Summer stream temperature monitoring began in 1994 to establish baseline data and to track changes that may be influenced by recovery of riparian habitat.

Summer stream temperature is monitored annually in the North Fork Payette River as part of ongoing evaluation of a minimum instream flow that was established in 2000 to provide for salmonid spawning and rearing (Idaho Department of Water Resources permit #65-13894).

Methods

Hobo temperature recorders (Onset model HTI, -5 to +35^{o}C) were deployed to monitor water temperature continuously, recording a temperature every 2.4 hours from July 04 to October 22, 2003. All recorders were in waterproof Onset model containers and secured by cable to a cinder block. The cinder block was placed in the stream and cabled to shore. Protocol described by Zaroban (2000) was followed to calibrate recorders prior to use.

Little Salmon River Drainage

The only recorder placed in the main Little Salmon River was located approximately 50 m downstream from Meadow Creek Subdivision Bridge, adjacent to Highway 95, at road mile 163.4 and at 45^{o} N latitude. One recorder was placed in Mud Creek, a headwater tributary to the LSR, immediately below the confluence with Little Mud Creek, under the Highway 95 Bridge.

North Fork Payette River

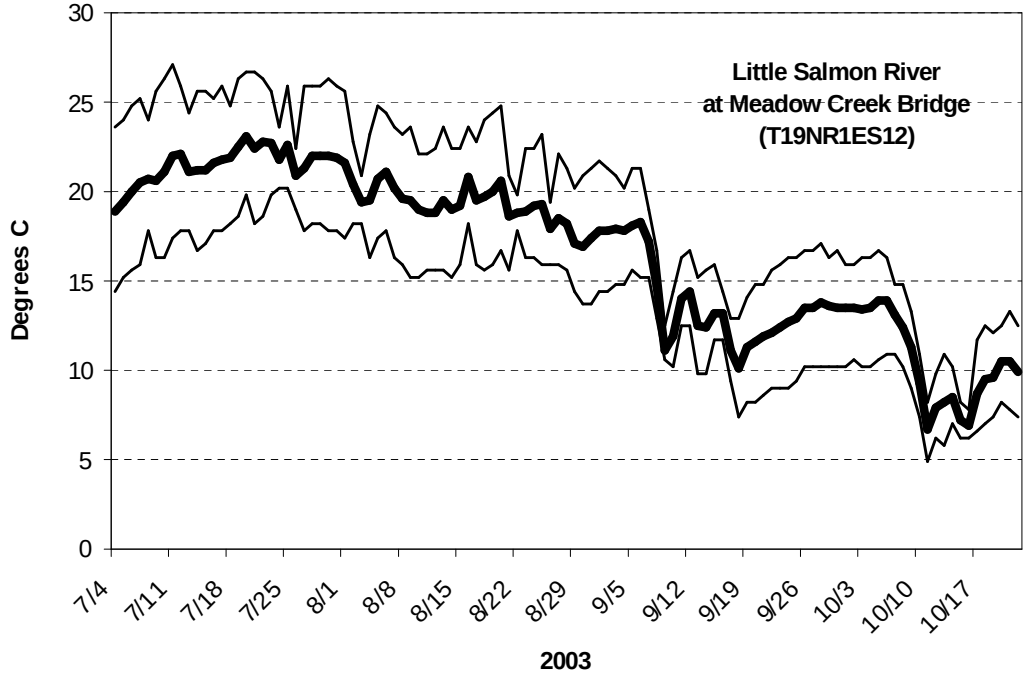
One temperature recorder was secured to the steel staff gauge that is associated with the USGS station in the NFPR approximately ¼ mile downstream from Fisher Creek.

Results

Figure 1 shows daily mean, minimum, and maximum stream temperatures for the upper Little Salmon River and Mud Creek. Summer stream temperatures in the upper Little Salmon River continue to be high, with daily mean temperatures exceeding 20°C consistently throughout July. High temperatures in Mud Creek were less severe, though higher than recorded in 2002, (Janssen et al. 2003) with daily means exceeding 20°C during most of July.

Figure 2 shows temperature data for the North Fork Payette River station. Summer stream temperatures in the North Fork Payette River remain adequate for rainbow trout rearing. Daily mean temperature reached a high of 21°C on one day only.

Appendix A shows each daily mean, minimum, and maximum temperature for all three stations.



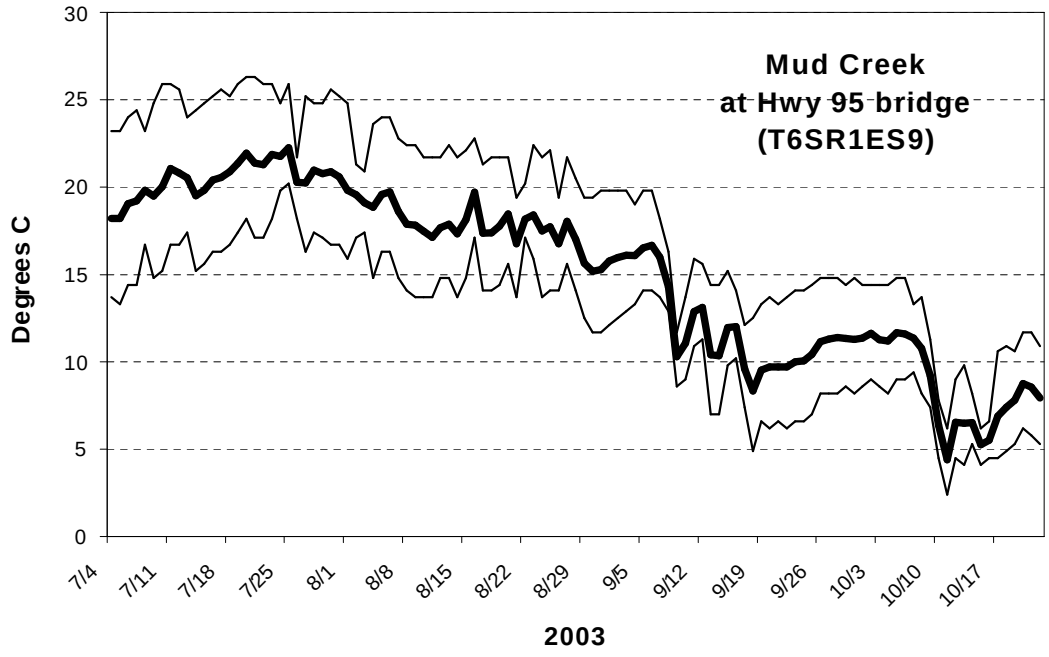


Figure 1. Summer stream temperatures in the Little Salmon River drainage, 2003.

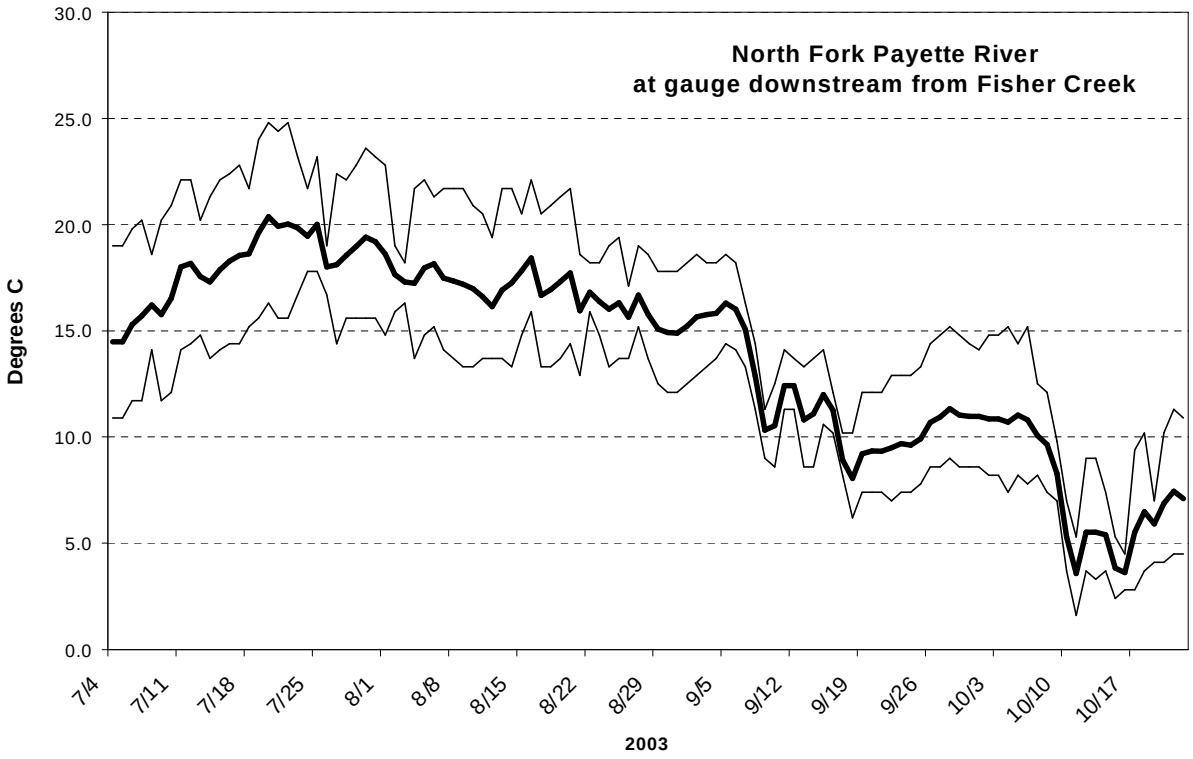


Figure 2. Summer stream temperatures in the North Fork Payette River, at USGS gauge downstream from Fisher Creek, 2003.

RECOMMENDATIONS

1. Continue temperature monitoring of McCall sub-regional waters.

2. Conduct riparian vegetation monitoring of restored areas of the upper Little Salmon River.

3. Conduct standard stream survey to document densities and species occurrence in area waters.

4. Conduct stream surveys in the North Fork Lake Fork Creek, North Fork Gold Fork River and Hornet Creek to document the presence of bull trout every five years to comply with the “Bull Trout Plan” of the USFWS.

5. Continue to count spawning kokanee in the North Fork Payette River above Payette Lake in the established trend area annually.

LITERATURE CITED

Anderson, D., D. Sculley, J. Hall-Griswold, B. Arnsberg. 1987, Federal aid in fish restoration. Regional Fishery Management Investigations. Job performance report 1986. Project F-71-R-11. Idaho Department of Fish and Game, Boise.

Janssen, P., D. Allen, K. A. Apperson. 2003. Federal aid in fish restoration. Regional Fishery management investigations. Job performance report, 2002. Project F-71-R-27. Idaho Department of Fish and Game, Boise.

Zaroban, Donald W. 2000. Protocol for placement and retrieval of temperature data loggers in Idaho streams. Water Quality Monitoring Protocols. Report No.10. Idaho Department of Environmental Quality, Boise.

APPENDIX

Appendix A. Daily mean, minimum, and maximum stream temperatures, 2003.

Little Salmon River at Meadow Creek Bridge, 2003											
Date	Mean	Min	Max	Date	Mean	Min	Max	Date	Mean	Min	Max
7/4	18.9	14.4	23.6	8/10	19.0	15.2	22.1	9/16	13.2	11.7	14.4
7/5	19.4	15.2	24.0	8/11	18.8	15.6	22.1	9/17	11.1	9.4	12.9
7/6	20.0	15.6	24.8	8/12	18.8	15.6	22.4	9/18	10.1	7.4	12.9
7/7	20.5	15.9	25.2	8/13	19.5	15.6	23.6	9/19	11.3	8.2	14.1
7/8	20.7	17.8	24.0	8/14	19.0	15.2	22.4	9/20	11.6	8.2	14.8
7/9	20.6	16.3	25.6	8/15	19.2	15.9	22.4	9/21	11.9	8.6	14.8
7/10	21.1	16.3	26.3	8/16	20.8	18.2	23.6	9/22	12.1	9.0	15.6
7/11	22.0	17.4	27.1	8/17	19.5	15.9	22.8	9/23	12.4	9.0	15.9
7/12	22.1	17.8	25.9	8/18	19.7	15.6	24.0	9/24	12.7	9.0	16.3
7/13	21.1	17.8	24.4	8/19	20.0	15.9	24.4	9/25	12.9	9.4	16.3
7/14	21.2	16.7	25.6	8/20	20.6	16.7	24.8	9/26	13.5	10.2	16.7
7/15	21.2	17.1	25.6	8/21	18.6	15.6	20.9	9/27	13.5	10.2	16.7
7/16	21.6	17.8	25.2	8/22	18.8	17.8	19.8	9/28	13.8	10.2	17.1
7/17	21.8	17.8	25.9	8/23	18.9	16.3	22.4	9/29	13.6	10.2	16.3
7/18	21.9	18.2	24.8	8/24	19.2	16.3	22.4	9/30	13.5	10.2	16.7
7/19	22.5	18.6	26.3	8/25	19.3	15.9	23.2	10/1	13.5	10.2	15.9
7/20	23.1	19.8	26.7	8/26	17.9	15.9	19.4	10/2	13.5	10.6	15.9
7/21	22.4	18.2	26.7	8/27	18.5	15.9	22.1	10/3	13.4	10.2	16.3
7/22	22.8	18.6	26.3	8/28	18.2	15.6	21.3	10/4	13.5	10.2	16.3
7/23	22.7	19.8	25.6	8/29	17.1	14.4	20.2	10/5	13.9	10.6	16.7
7/24	21.8	20.2	23.6	8/30	16.9	13.7	20.9	10/6	13.9	10.9	16.3
7/25	22.6	20.2	25.9	8/31	17.4	13.7	21.3	10/7	13.1	10.9	14.8
7/26	20.9	19.0	22.4	9/1	17.8	14.4	21.7	10/8	12.4	10.2	14.8
7/27	21.3	17.8	25.9	9/2	17.8	14.4	21.3	10/9	11.3	9.0	13.3
7/28	22.0	18.2	25.9	9/3	17.9	14.8	20.9	10/10	9.3	7.4	10.9
7/29	22.0	18.2	25.9	9/4	17.8	14.8	20.2	10/11	6.7	4.9	8.2
7/30	22.0	17.8	26.3	9/5	18.1	15.6	21.3	10/12	7.9	6.2	9.8
7/31	21.9	17.8	25.9	9/6	18.3	15.2	21.3	10/13	8.2	5.8	10.9
8/1	21.6	17.4	25.6	9/7	17.2	15.2	19.0	10/14	8.5	7.0	10.2
8/2	20.4	18.2	22.8	9/8	14.7	12.9	16.7	10/15	7.2	6.2	8.2
8/3	19.4	18.2	20.9	9/9	11.1	10.6	12.5	10/16	6.9	6.2	7.8
8/4	19.5	16.3	23.2	9/10	11.9	10.2	14.4	10/17	8.7	6.6	11.7
8/5	20.7	17.4	24.8	9/11	14.0	12.5	16.3	10/18	9.5	7.0	12.5
8/6	21.1	17.8	24.4	9/12	14.4	12.5	16.7	10/19	9.6	7.4	12.1
8/7	20.2	16.3	23.6	9/13	12.5	9.8	15.2	10/20	10.5	8.2	12.5
8/8	19.6	15.9	23.2	9/14	12.4	9.8	15.6	10/21	10.5	7.8	13.3
8/9	19.5	15.2	23.6	9/15	13.2	11.7	15.9	10/22	9.9	7.4	12.5

Appendix A. Continued.

Mud Creek, at Hwy 95 Bridge (tributary to Little Salmon River), 2003											
Date	Mean	Min	Max	Date	Mean	Min	Max	Date	Mean	Min	Max
7/4	18.2	13.7	23.2	8/10	17.5	13.7	21.7	9/16	12.0	10.2	14.1
7/5	18.2	13.3	23.2	8/11	17.1	13.7	21.7	9/17	9.6	7.4	12.1
7/6	19.0	14.4	24.0	8/12	17.7	14.8	21.7	9/18	8.3	4.9	12.5
7/7	19.2	14.4	24.4	8/13	17.9	14.8	22.4	9/19	9.5	6.6	13.3
7/8	19.8	16.7	23.2	8/14	17.3	13.7	21.7	9/20	9.7	6.2	13.7
7/9	19.5	14.8	24.8	8/15	18.1	14.8	22.1	9/21	9.7	6.6	13.3
7/10	20.0	15.2	25.9	8/16	19.7	17.1	22.8	9/22	9.7	6.2	13.7
7/11	21.1	16.7	25.9	8/17	17.4	14.1	21.3	9/23	10.0	6.6	14.1
7/12	20.8	16.7	25.6	8/18	17.4	14.1	21.7	9/24	10.1	6.6	14.1
7/13	20.5	17.4	24.0	8/19	17.8	14.4	21.7	9/25	10.4	7.0	14.4
7/14	19.5	15.2	24.4	8/20	18.5	15.6	21.7	9/26	11.1	8.2	14.8
7/15	19.8	15.6	24.8	8/21	16.8	13.7	19.4	9/27	11.3	8.2	14.8
7/16	20.4	16.3	25.2	8/22	18.2	17.1	20.2	9/28	11.4	8.2	14.8
7/17	20.6	16.3	25.6	8/23	18.4	15.9	22.4	9/29	11.3	8.6	14.4
7/18	20.9	16.7	25.2	8/24	17.5	13.7	21.7	9/30	11.3	8.2	14.8
7/19	21.3	17.4	25.9	8/25	17.7	14.1	22.1	10/1	11.4	8.6	14.4
7/20	22.0	18.2	26.3	8/26	16.8	14.1	19.4	10/2	11.6	9.0	14.4
7/21	21.4	17.1	26.3	8/27	18.0	15.6	21.7	10/3	11.3	8.6	14.4
7/22	21.3	17.1	25.9	8/28	17.0	14.1	20.5	10/4	11.2	8.2	14.4
7/23	21.9	18.2	25.9	8/29	15.6	12.5	19.4	10/5	11.7	9.0	14.8
7/24	21.8	19.8	24.8	8/30	15.2	11.7	19.4	10/6	11.6	9.0	14.8
7/25	22.3	20.2	25.9	8/31	15.3	11.7	19.8	10/7	11.4	9.4	13.3
7/26	20.3	18.2	21.7	9/1	15.8	12.1	19.8	10/8	10.8	8.2	13.7
7/27	20.2	16.3	25.2	9/2	16.0	12.5	19.8	10/9	9.2	7.4	11.3
7/28	21.0	17.4	24.8	9/3	16.1	12.9	19.8	10/10	6.4	4.5	7.8
7/29	20.8	17.1	24.8	9/4	16.1	13.3	19.0	10/11	4.4	2.4	6.2
7/30	20.9	16.7	25.6	9/5	16.5	14.1	19.8	10/12	6.5	4.5	9.0
7/31	20.6	16.7	25.2	9/6	16.7	14.1	19.8	10/13	6.5	4.1	9.8
8/1	19.8	15.9	24.8	9/7	16.0	13.7	18.2	10/14	6.5	5.3	8.2
8/2	19.6	17.1	21.3	9/8	14.3	12.9	16.3	10/15	5.3	4.1	6.2
8/3	19.1	17.4	20.9	9/9	10.3	8.6	11.7	10/16	5.5	4.5	6.6
8/4	18.8	14.8	23.6	9/10	11.1	9.0	13.7	10/17	6.9	4.5	10.6
8/5	19.6	16.3	24.0	9/11	12.9	10.9	15.9	10/18	7.4	4.9	10.9
8/6	19.7	16.3	24.0	9/12	13.1	11.3	15.6	10/19	7.8	5.3	10.6
8/7	18.6	14.8	22.8	9/13	10.4	7.0	14.4	10/20	8.8	6.2	11.7
8/8	17.9	14.1	22.4	9/14	10.4	7.0	14.4	10/21	8.6	5.8	11.7
8/9	17.8	13.7	22.4	9/15	12.0	9.8	15.2	10/22	7.9	5.3	10.9

Appendix A. Continued.

North Fork Payette River at gauging station downstream from Fisher Creek, 2003											
Date	Mean	Min	Max	Date	Mean	Min	Max	Date	Mean	Min	Max
7/4	14.5	10.9	19.0	8/10	17.0	13.3	20.9	9/16	11.3	10.2	12.1
7/5	14.5	10.9	19.0	8/11	16.6	13.7	20.5	9/17	8.9	8.2	10.2
7/6	15.3	11.7	19.8	8/12	16.1	13.7	19.4	9/18	8.1	6.2	10.2
7/7	15.7	11.7	20.2	8/13	16.9	13.7	21.7	9/19	9.2	7.4	12.1
7/8	16.2	14.1	18.6	8/14	17.2	13.3	21.7	9/20	9.4	7.4	12.1
7/9	15.8	11.7	20.2	8/15	17.8	14.8	20.5	9/21	9.3	7.4	12.1
7/10	16.5	12.1	20.9	8/16	18.4	15.9	22.1	9/22	9.5	7.0	12.9
7/11	18.0	14.1	22.1	8/17	16.7	13.3	20.5	9/23	9.7	7.4	12.9
7/12	18.2	14.4	22.1	8/18	16.9	13.3	20.9	9/24	9.6	7.4	12.9
7/13	17.6	14.8	20.2	8/19	17.3	13.7	21.3	9/25	9.9	7.8	13.3
7/14	17.3	13.7	21.3	8/20	17.7	14.4	21.7	9/26	10.7	8.6	14.4
7/15	17.9	14.1	22.1	8/21	15.9	12.9	18.6	9/27	10.9	8.6	14.8
7/16	18.3	14.4	22.4	8/22	16.8	15.9	18.2	9/28	11.3	9.0	15.2
7/17	18.5	14.4	22.8	8/23	16.4	14.8	18.2	9/29	11.0	8.6	14.8
7/18	18.6	15.2	21.7	8/24	16.0	13.3	19.0	9/30	11.0	8.6	14.4
7/19	19.6	15.6	24.0	8/25	16.3	13.7	19.4	10/1	11.0	8.6	14.1
7/20	20.4	16.3	24.8	8/26	15.6	13.7	17.1	10/2	10.8	8.2	14.8
7/21	19.9	15.6	24.4	8/27	16.7	15.2	19.0	10/3	10.8	8.2	14.8
7/22	20.0	15.6	24.8	8/28	15.8	13.7	18.6	10/4	10.7	7.4	15.2
7/23	19.9	16.7	23.2	8/29	15.1	12.5	17.8	10/5	11.0	8.2	14.4
7/24	19.5	17.8	21.7	8/30	14.9	12.1	17.8	10/6	10.8	7.8	15.2
7/25	20.0	17.8	23.2	8/31	14.9	12.1	17.8	10/7	10.1	8.2	12.5
7/26	18.0	16.7	19.0	9/1	15.2	12.5	18.2	10/8	9.6	7.4	12.1
7/27	18.1	14.4	22.4	9/2	15.7	12.9	18.6	10/9	8.3	7.0	9.8
7/28	18.5	15.6	22.1	9/3	15.8	13.3	18.2	10/10	5.3	3.7	7.0
7/29	19.0	15.6	22.8	9/4	15.8	13.7	18.2	10/11	3.6	1.6	5.3
7/30	19.4	15.6	23.6	9/5	16.3	14.4	18.6	10/12	5.5	3.7	9.0
7/31	19.2	15.6	23.2	9/6	16.0	14.1	18.2	10/13	5.5	3.3	9.0
8/1	18.6	14.8	22.8	9/7	15.1	13.3	16.3	10/14	5.4	3.7	7.4
8/2	17.7	15.9	19.0	9/8	12.9	11.3	14.4	10/15	3.8	2.4	5.3
8/3	17.3	16.3	18.2	9/9	10.3	9.0	11.3	10/16	3.6	2.8	4.5
8/4	17.2	13.7	21.7	9/10	10.5	8.6	12.5	10/17	5.5	2.8	9.4
8/5	18.0	14.8	22.1	9/11	12.4	11.3	14.1	10/18	6.5	3.7	10.2
8/6	18.2	15.2	21.3	9/12	12.4	11.3	13.7	10/19	5.9	4.1	7.0
8/7	17.5	14.1	21.7	9/13	10.8	8.6	13.3	10/20	6.9	4.1	10.2
8/8	17.3	13.7	21.7	9/14	11.1	8.6	13.7	10/21	7.4	4.5	11.3
8/9	17.2	13.3	21.7	9/15	12.0	10.6	14.1	10/22	7.1	4.5	10.9

2003 ANNUAL PERFORMANCE REPORT

State of: Idaho Program: Fisheries Management F-71-R-28

Project III: Habitat Management Subproject III-C: Southwest Region (McCall)

Contract Period: January 1, 2003 to December 31, 2003

ABSTRACT

Temperature monitoring was conducted on the upper Little Salmon river basin throughout the 2003 summer season. Water temperature data was also collected on several sites in the North Fork Payette River.

Regional personnel worked with the Council Ranger District USFS, the East Fork Irrigation Company, and the US Bureau of Reclamation to design a flat plate fish screen for the East Fork Ditch diversion off of the East Fork Weiser River. The project was funded with FRIMA funds and local cost share match. Construction of the diversion structure is scheduled for August 2004. Planning efforts were begun to retrofit the Mahala water diversion on Lake Fork Creek with an automatic screen-cleaning device.

Author:

Dale B. Allen
Regional Fishery Manager

2003 ANNUAL PERFORMANCE REPORT

State of: Idaho Program: Fisheries Management F-71-R-28

Project II: Technical Guidance Subproject:II-C: Southwest Region (McCall)

Contract Period: January 1, 2003 to December 31, 2003

ABSTRACT

McCall office of the Southwest Region fishery management personnel responded to numerous requests and opportunities for technical input. Comments were provided to state and federal agencies on proposed activities for which they have regulatory authority. Advice and technical assistance were provided to private businesses and the public on activities associated with fish, or having impacts on fish populations or fish habitat. The major topics of involvement included stream channel alterations, Idaho Outfitters and Guides licensing, private pond permits, and land management planning. We provided data and technical advice to an increased number of fisheries consultants.

Regional fishery personnel continued participation on a technical advisory committee for the Big Payette Lake Water Quality Council.

Regional fishery personnel attended quarterly meetings of the Weiser River Watershed Advisory Group as the group develops the TMDL document for the Weiser River. Another WAG was created for the Little Salmon River basin and fishery staff participated. Fishery personnel continued participation on a technical advisory committee for the Cascade Restoration Project to improve water quality in Lake Cascade.

We also gave numerous presentations to schools, sportsperson groups, and civic organizations. We answered many questions from the angling public on fishing opportunities, regulations, techniques, and specific water. We maintained fishing reports for the IDFG Internet Homepage.

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